FM 2-91.4

INTELLIGENCE SUPPORT TO URBAN OPERATIONS

HEADQUARTERS, DEPARTMENT OF THE ARMY

March 2008

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FM 2-91.4

Field Manual
No. 2-91.4

Headquarters
Department of the Army
Washington, DC, 20 March 2008

Intelligence Support to Urban Operations

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Preface

This Field Manual (FM)—

- Expands and clarifies the doctrinal foundation found in FM 3-06 and JP 3-06 for Intelligence Support to Operations in the Urban Environment.
- Incorporates intelligence and operational doctrine and terminology from FM 3-06 and FM 3-06.11.
- Provides intelligence professionals a basic framework within which to focus on providing commanders with effective intelligence support for their operations in the urban environment.

This manual is designed primarily for the intelligence staffs and Soldiers of units conducting intelligence support to operations in the urban environment. It can also be used by commanders, staffs, and intelligence personnel at all echelons, and applies equally to the Active Army, the Army National Guard (ARNG)/Army National Guard of the United States (ARNGUS), and the United States Army Reserve (USAR) unless otherwise stated.

US Training and Doctrine Command is the proponent for this publication. The preparing agency is the US Army Intelligence Center and School. We welcome your command and recommended changes. Please email them directly to the proponent at ATZS-FDC-D@us.army.mil, or mail them to: Commander, ATTN: ATZS-CDI-D, US Army Intelligence Center and Fort Huachuca, 550 Cibeque Street, Fort Huachuca, AZ 85613-7017.

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Introduction

With the continuing growth in the world's urban areas and increasing population concentrations in urban areas, the probability that the US Army will conduct full spectrum operations in urban environments is ever more likely. As urbanization has changed the demographic landscape, potential enemies recognize the inherent danger and complexity of this environment to the attacker, and may view it as their best chance to negate the technological and firepower advantages of modernized opponents. Given the global population trends and the likely strategies and tactics of future threats, Army forces will likely conduct operations in, around, and over urban areas—not as a matter of fate, but as a deliberate choice linked to national security objectives and strategy. Stability operations—where keeping the social structure, economic structure, and political support institutions intact and functioning or having to almost simultaneously provide the services associated with those structures and institutions is the primary mission—may dominate urban operations. This requires specific and timely intelligence support, placing a tremendous demand on the Intelligence warfighting functions for operations, short-term planning, and long-term planning.

Providing intelligence support to operations in the complex urban environment can be quite challenging and may at first seem overwhelming. The amount of detail required for operations in urban environments, along with the large amounts of varied information required to provide intelligence support to these operations, can be daunting. Intelligence professionals must be flexible and adaptive in applying doctrine and tactics, techniques, and procedures (TTP) based on mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC).

As with operations in any environment, a key to providing good intelligence support in the urban environment lies in identifying and focusing on the critical information required for each specific mission. The complexity of the urban environment requires focused intelligence, and a comprehensive framework must be established to support the commander's requirements while managing the vast amount of information and intelligence required for urban operations. By addressing the issues and considerations listed in this manual, the commander, G-2/S-2, and intelligence analyst will be able to address most of the critical aspects of the urban environment and identify both the gaps in the intelligence collection effort and those systems and procedures that may answer them. This will assist the commander in correctly identifying enemy actions so that US forces can focus on the enemy and seize the initiative while maintaining an understanding of the overall situation.

FM 3-06.11 and FM 3-06 provide supporting material relevant to this FM.

Chapter 1
Intelligence and the Urban Environment

1-1. The special considerations that must be taken into account in any operation in an urban environment go well beyond the uniqueness of the urban terrain. JP 3-06 identifies three distinguishing characteristics of the urban environment: physical terrain, population, and infrastructure. Also, FM 3-06 identifies three key overlapping and interdependent components of the urban environment: terrain (natural and manmade), society, and the supporting infrastructure.

CIVIL CONSIDERATIONS (ASCOPE)

1-2. Normally the factors used in the planning and execution of tactical military missions are evaluated as METT-TC. Due to the importance of civil considerations (the letter "C" in METT-TC) in urban operations, those factors are discussed first in this manual. Civil considerations comprise the influence of manmade infrastructure, civilian institutions, and attitudes and activities of the civilian leaders, populations, and organizations within an area of operation (AO) on the conduct of military operations. They are a factor in all types of military operations: offense, defense, stability, and civil support. If the military's mission is to support civil authorities, civil considerations define the mission.

1-3. An appreciation of civil considerations and the ability to analyze their impact on operations enhances several aspects of urban operations—among them, the selection of objectives; location, movement, and control of forces; use of weapons; and force protection (FP) measures. Civil considerations comprise six characteristics, expressed in the mnemonic **ASCOPE:**

- **A**reas.
- **S**tructures.
- **C**apabilities.
- **O**rganizations.
- **P**eople.
- **E**vents.

1-4. ASCOPE factors, in conjunction with the components of the urban environment, provide a useful structure for intelligence personnel to begin to focus their intelligence preparation of the battlefield (IPB) and organize the huge undertaking of providing intelligence to operations in the urban environment. They should not be considered as separate entities but rather as interdependent. Understanding this interrelationship of systems provides focus for the intelligence analyst and allows the commander a greater understanding of the urban area in question. (See figure 1-1.)

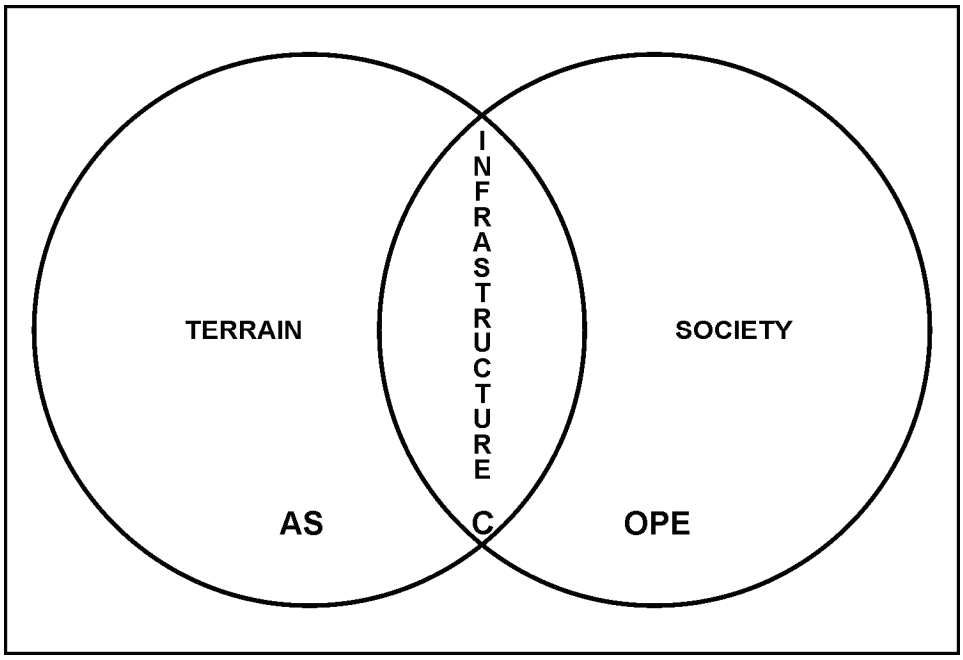


Figure 1-1. Keys to understanding the urban environment

TERRAIN AND WEATHER

TERRAIN

1-5. Terrain in the urban environment is complex and challenging. It possesses all the characteristics of the natural landscape, coupled with manmade construction, resulting in a complicated and fluid environment that influences the conduct of military operations in unique ways. Urban areas, the populace within them, their expectations and perceptions, and the activities performed within their boundaries form the economic, political, and cultural focus for the surrounding areas. What military planners must consider for "urban" areas may range from a few dozen dwellings surrounded by farmland to major metropolitan cities.

1-6. Prior to conducting operations in urban areas, it is critical to understand the terrain. Much of the difficulty and confusion with planning and conducting operations in the urban environment results from a basic lack of understanding of the common characteristics of urban terrain. Order does exist in the urban environment and characteristics can be quantified, or at least described sufficiently, to enable planning.

1-7. Density of construction and population, street patterns, compartmentalization, affluent and poor sections, modernization, and presence of utility systems characterize all cities of the world. The differences in urban areas are in size, level of development, and style.

1-8. Due to the historical impact of colonization over centuries, most major cities throughout the world have European characteristics. They have combination street patterns, distinct economic and ethnic sections, and areas known as shantytowns—all of which present potential obstacles, or at least challenges, to operations.

1-9. Variations in cities are caused mainly by differences in economic development, government policies, and cultural needs. Some urban trends include high-rise apartments, reinforced concrete construction,

truck- related industrial storage, shopping centers, detached buildings, suburbs at outer edges, apartment complexes, and major subterranean infrastructure that support the city.

1-10. Urban topography is an elaborate combination of horizontal, vertical, interior, and exterior forms superimposed on a landscape's natural relief, drainage, and vegetation. Urban areas may range from a few dozen dwellings to major metropolitan areas. A city may be technologically advanced or developing. Most cities feature many construction styles and building materials, each with its own texture and strength. Concrete and steel high-rise structures may stand alongside tin or wooden shacks. Additionally, lines of communication (LOCs) often consist of a confusing array of roads, alleys, bridges, elevated roadways, subway tunnels, rail systems, drainage canals, and sewer networks.

1-11. In the close confines of urban areas, small arms and light weapons (such as rocket-propelled grenades) can have a dramatic effect. Urban operations can radically alter the physical nature of the terrain. For example, the walls and roofs may collapse on some buildings, or whole city blocks may be destroyed or burned down, leaving only piles of rubble. These effects can be tactically significant, as some key terrain features completely disappear and fields of fire open and close.

1-12. Buildings affect wave propagation, thus degrading friendly command and control (C2) and some intelligence, surveillance, and reconnaissance (ISR) efforts. While streets provide the means for rapid advance or withdrawal, military vehicles moving along streets are often channeled by buildings and have little space for maneuver. Because they are more difficult to bypass, obstacles on streets in urbanized areas are usually more effective than those on roads in open terrain. Forced to maneuver through congested city streets, US forces must account for the volume of vehicle and pedestrian traffic. Operating forces should expect noncombatants to inadvertently or intentionally constrain fire and movement.

1-13. Small teams of enemy combatants can rapidly assimilate themselves within the urban population. In order to limit the possibility of excessive collateral damage in relation to the direct military advantage anticipated, US forces may use conservative collateral estimation methodologies and fire control measures which may limit some lethal options and require more detailed planning and coordination, as well as authorization from higher levels of command.

1-14. Urban areas are usually regional centers of finance, politics, transportation, industry, and culture. They have population concentrations ranging from several thousand up to millions of people. The larger the city, the greater its regional influence. Because of their psychological, political, and/or logistical value, control of regionally important cities has often led to pitched battle scenes. In the last 40 years, many cities have expanded dramatically, losing their well-defined boundaries as they extend into the countryside. Transportation systems (highways, canals, and railroads) are built to connect population centers. Industries grow along these connectors, creating "strip areas." Rural areas, although retaining much of their farm-like character, are connected to towns by a network of secondary roads. Not all connecting roads are paved, let alone depicted on maps.

1-15. Urban terrain is a unique environment that provides both attacker and defender with numerous avenues of approach (AAs) and fields of fire. Urban terrain is divided into four basic levels. Operations can be conducted from all of these levels, and most operations will include actions on all levels simultaneously.

- Air.
- Supersurface.
- Surface.
- Subsurface.

Urban Areas

1-16. As defined in FM 3-06, urban areas are generally classified as—

- Megalopolis – (population over 10 million).
- Metropolis – (population between 1 to 10 million).
- City – (population 100,000 to 1 million).
- Town or small city – (population 3,000 to 100,000).
- Village – (population < 3,000).

Urban Patterns

1-17. Manmade terrain in the urban environment is overlaid on the natural terrain of the area, and manmade patterns are affected by the underlying natural terrain. It can be useful to keep the underlying natural terrain in mind when analyzing the manmade patterns of the urban environment. For example, roads will often follow the contours of the underlying terrain and parks may be built in areas unsuitable to building construction such as flood plains. Four major urban patterns can influence operations in the urban environment. (See Figure 1-2.)

1-18. Hub and Satellite Patterns.

- Central to two of the patterns (satellite and network) is the hub, or dominant urban area or pattern, around which outlying urban areas or patterns radiate. (A segmented urban area, because it tends to be a larger urban area, can often be a hub.) In offensive and defensive operations, the hub serves as a pivot or strong point; as such, it often becomes a major obstacle to an attacker. If the attacker chooses to bypass the urban area (hub) located along his axis of advance without first isolating the area, he may expose his flank to attack from the hub as well as dependent urban areas or subordinate satellite patterns. Because the focus of stability operations and civil support operations is on people, commanders understand the value and influence of the hub to the economic, political, or cultural well being of the surrounding area. Whether or not a hub, commanders must remember that urban areas are not islands; all are connected to the surrounding rural (and other urban) areas through fluid and permeable boundaries and LOCs.
- The satellite pattern consists of a central hub surrounded by smaller, dependent urban areas. LOCs tend to converge on the hub. The natural terrain throughout this pattern is relatively homogenous. Outlying areas often support the principal urban area at the hub with means of reinforcement, resupply, and evacuation. In some instances, they may serve as mutually supporting battle positions. Commanders should consider the effects of the outlying urban AOs within the hub and, conversely, the effects of operations within the hub on outlying urban areas. Information operations (IO), for example, targeted primarily at the hub of a satellite pattern may subsequently influence outlying urban areas and achieve necessary effects without having to commit specific resources to these areas.

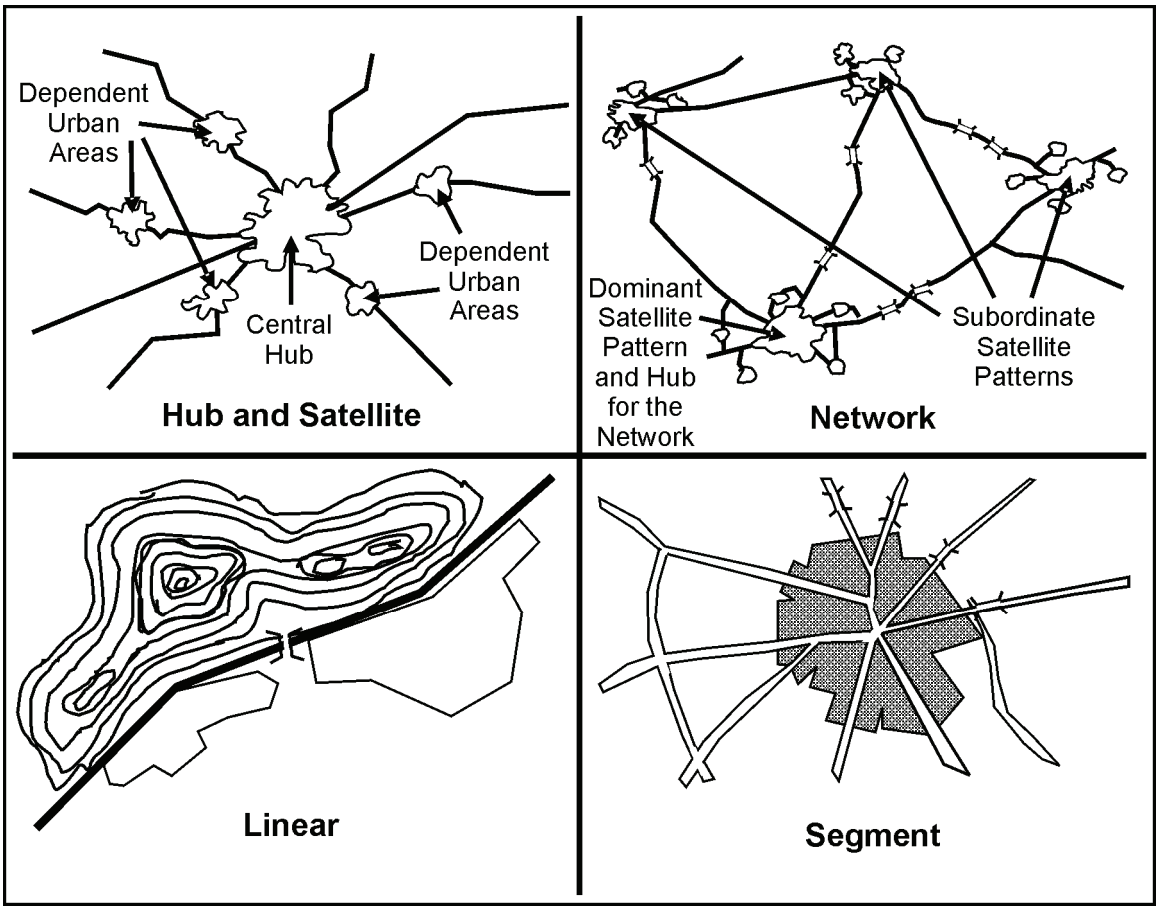


Figure 1-2. Urban layout patterns

1-19. Network Pattern. The network pattern represents the interlocking of the primary hubs of subordinate satellite patterns. Its elements are more self-sufficient and less supportive of each other, although a dominant hub may exist. Major LOCs in a network extend more than in a satellite pattern and take more of a rectangular rather than a convergent form. Its natural terrain may vary more than in a single satellite array. Operations in one area may or may not easily influence, or be influenced by, other urban areas in the pattern.

1-20. Linear Pattern. Potentially a sub-element of the network and satellite patterns, the linear pattern may form one ray of the satellite pattern or be found along connecting links between the hubs of a network. Most frequently, this pattern results from the stringing of minor urban areas along a confined natural terrain corridor, such as an elongated valley, a body of water, or a manmade communications route. In offensive and defensive operations, this latter form of the linear pattern facilitates developing a series of strong defensive positions in depth, effectively blocking or delaying an attacking force moving along the canalized terrain.

1-21. Segment Pattern. When dominant natural terrain (such as a river) divides an urban area, it creates a segmented pattern. This pattern often makes it easier for commanders to assign AOs to subordinate commanders. However, this pattern may fragment operations and increase risk to an operation requiring mutual support between subordinate units. The segmented urban areas may allow commanders to isolate threats more easily in these areas and focus operations within segments that contain their decisive points.

Although an integral part of the whole (the urban area), each segment may develop distinct social, economic, cultural, and political characteristics. This social segmenting may benefit commanders faced with limited assets to influence or control the urban populace. A thorough analysis of the society may allow the intelligence analyst to help the commander focus IO and populace and resources control measures against only specific segments that affect decisive operations. Analysts should consider how isolating segments or just monitoring segments for any significant changes in the attitudes, beliefs, or actions of the civilians located there may aid in mission accomplishment.

Pattern Effects

1-22. There are three major urban pattern effects: blocking, funnel, and funnel-fans. (See table 1-1.) The consequences of maneuvering military units within the urban patterns identified in table 1-1 will significantly effect combat operations. In addition to the basic blocking action caused by the hub phenomenon, other effects can be associated with urban patterns. See figure 1-3 for an example of the funnel-fan effect.

Table 1-1. Urban pattern effects

Effect	Description
Blocking Effect	Often the shape and density of the hub, width of major streets, and proximity of side streets have, either individually or combined, the effect of blocking or degrading movement into and out of an urban zone.
Funnel Effect	Funnel or concentration and canalization of forces may occur without immediate fanning. This occurs most frequently when the linear pattern is encountered. The linear pattern limits the number of maneuver units that may be applied against a series of hubs that must be confronted in succession and forces a greater reliance on long-range and indirect fire weapons.
Funnel-Fan Effect	The funnel-fan effect normally occurs when the hub is located between terrain features that are unsuitable for mounted operations. Movement of units into the hub area results in the unwanted concentration of units, loss of offensive momentum, and canalization. Beyond the hub, units are required to spread or or fan out before full combat power can be achieved. The funnel-fan effect favors the defense because it creates an accordion effect in units moving through the hub, reducing C2 and operation effectiveness.

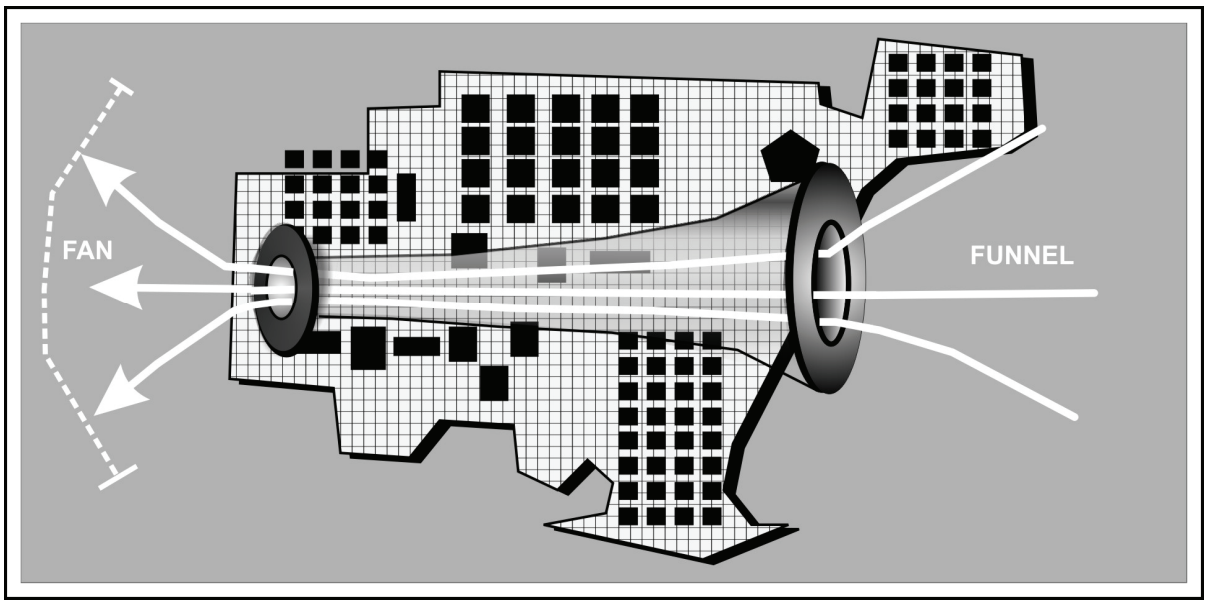


Figure 1-3. Funnel-fan effect

Urban Functional Zones

1-23. To provide an accurate depiction of an urban area, it is necessary to have a basic understanding of its numerous physical subdivisions or zones. These zones are functional in nature and reflect "where" something routinely occurs within the urban area. The structure of these zones will vary from country to country. For example, a country book may describe Yongin, South Korea, "as a typical Korean city with cities within a city, a city core, urban sprawl, and outlying industry." Another country book might describe Cologne, Germany, as "a typical German city with narrow streets, circular configuration, and low terrain." Both definitions are accurate but provide little practical use to the analyst. What is required is a more substantial definition of these urban zones as well as employment of standardized terminology. (Refer to FM 3-06 for a more detailed discussion of the zones.) The following defines the urban functional zones:

- Core: The core is the heart of the urban area, the downtown or central business district. It is relatively small and compact, but contains a larger percentage of the urban area's shops, offices, and public institutions. It will also normally house the highest density of multi-story buildings and subterranean features.
- Core Periphery: This area is located at the edges of the core. Generally, it has undergone less change than the core resulting in buildings of uniform height (generally two to three stories in towns and five to ten stories in larger cities).
- Industrial Area: Industrial areas often developed on the outskirts of the urban areas where commercial transportation is easiest (along airfields and major sea, river, rail, and highway routes). The dispersed pattern of the buildings provides sufficient space for large cargoes, trucks, and material-handling equipment. These areas may provide ideal sites for logistic bases and maintenance sites. Multi-story structures usually have reinforced concrete floors and ceilings. Additionally, the industrial area may include large storage areas of chemicals, petroleum products, fertilizers, and other toxic materials. In the more advanced states many of these areas have been abandoned or have undergone change to another type of zone as the industrial areas have moved.

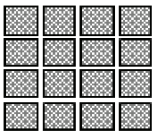
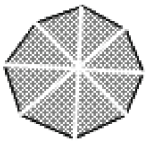
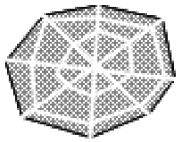
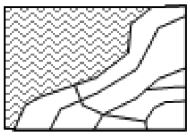
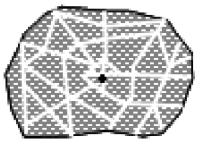
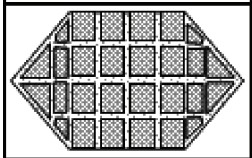
- High-Rise Area: High-rise areas consist of multi-storied apartments, commercial offices, and businesses separated by large open areas such as parking lots, parks, sports arenas, and smaller single-story structures. High-rise buildings are framed, light-clad construction, with thin walls of brick, lightweight concrete, or glass.
- Residential Area: Residential areas can be found dispersed throughout the urban area; however, large suburban areas (or sprawl) normally form on the outskirts of the city proper. Residential areas often consist of row houses or single-family dwellings set in a grid or ringed pattern within a planned development project. It may also include many of the urban area's supporting infrastructure (power, water, communications).
- Commercial Ribbon Area: Commercial ribbon areas include rows of stores, shops, and restaurants built along both sides of major streets that run through and between urban areas and often serve to connect one urban area to another. Structures here are usually smaller than those found in the industrial and high-rise areas but larger than those found in residential areas (three to five stories).
- Military Areas: Fortifications and military installations are found everywhere in the world and should be given special consideration because they have been specifically built for military purposes. Permanent-type fortifications can be made of earth, wood, rock, brick, concrete, steel-reinforced concrete, or any combination of the above. Some of the latest variants have been built underground and employ heavy tank or warship armor, major caliber and other weapons, internal communications, service facilities, and chemical, biological, radiological, and nuclear (CBRN) overpressure systems. Many of the Baltic States possess long coastlines relative to their overall size. To meet their defensive needs, they have developed coast defense works that include extensive subterranean facilities, many contiguous to urban areas. Other nations share borders with potentially hostile neighbors. North Korea is a prime example, with numerous hardened artillery, missile, and C2 facilities along both of its coasts as well as along the demilitarized zone. The analyst should also realize that even if depicted as "inactive," these fortifications might be rapidly modified to their original role and even if not activated they may still serve as choke points and obstacles. Finally, even if hardened fortifications are not present, many cities include large military garrisons. Examples of cities with large military garrisons include Capetown, South Africa (Table Mountain), and Seoul, South Korea.

Street Patterns

1-24. The development of street patterns within a given urban environment can be attributed to an architect's deliberate design, natural features, and manmade structures that serve in various capacities. Geographers have identified at least eight major street patterns with any number of variations. Table 1-2 shows these major street patterns.

1-25. These patterns exist for trafficability in daily life but also can be significant during military operations. The core areas of both Paris and Washington, DC, were originally laid out in a rayed pattern to maximize the defensibility of the government buildings. These were later modified to radial and radial-ring patterns. During Russian operations in Grozny, the Chechnyans used the city's street patterns to maximize their ability to strike at Russian armor while at the same time minimizing the Russians' ability to return massed fires.

Table 1-2. Street patterns and effects

Shape	Street Pattern	Effect
	Rectangular or Chessboard	Streets are grid-like, with parallel streets intersected by perpendicular streets.
	Rayed	Streets that fan out at various angles from a given focal point and through less than 360 degrees.
	Radial	Primary thoroughfares radiate out from a central point. These streets may be extended outward 360 degrees around the central point or within an arc from a point along a natural barrier, such as a coastline.
	Radial-Ring	Loops or rings are surrounded by successively larger ones, and are usually found in conjunction with larger radial patterns. Radial rings incorporate the elements of both radial and ring or concentric designs.
	Contour Forming	Pronounced terrain relief influences construction of roadway along lines of elevation. Primary streets run parallel to control lines, with intersecting roads connecting them.
	Irregular Pattern	Irregular street patterns have been specifically engineered without geometric patterns for aesthetic or functional reasons. An American subdivision with curving streets and cul-de-sacs is an example.
	Combined Pattern	Any combination of the above and is best demonstrated by the development of high-rise and business districts in medieval or pre-medieval cities.
	Linear Pattern	A primary thoroughfare runs down the center with buildings on either side. American strip malls and main shopping districts are patterned this way for ease and convenience.

Multidimensional Battlefield

1-26. Commanders operating in unrestricted terrain normally address their AO and area of interest (AOI) in terms of air and ground. However, operations within the urban environment provide numerous manmade structures and variables not found in unrestricted terrain. Commanders conducting urban operations must broaden the scope of their thinking, looking not only at the air and ground but also at the threats that may appear from a structure's top, exterior or interior, as well as subsurface areas.

1-27. FM 3-06 addresses the multidimensional battlefield and identifies the dimensions that must be considered as air, supersurface, surface, and subsurface. Although spatially separated, each dimension is interrelated and may be used as an AA or mobility corridor, LOC, or engagement area. The elements of the multidimensional urban battlefield are depicted in figure 1-4.

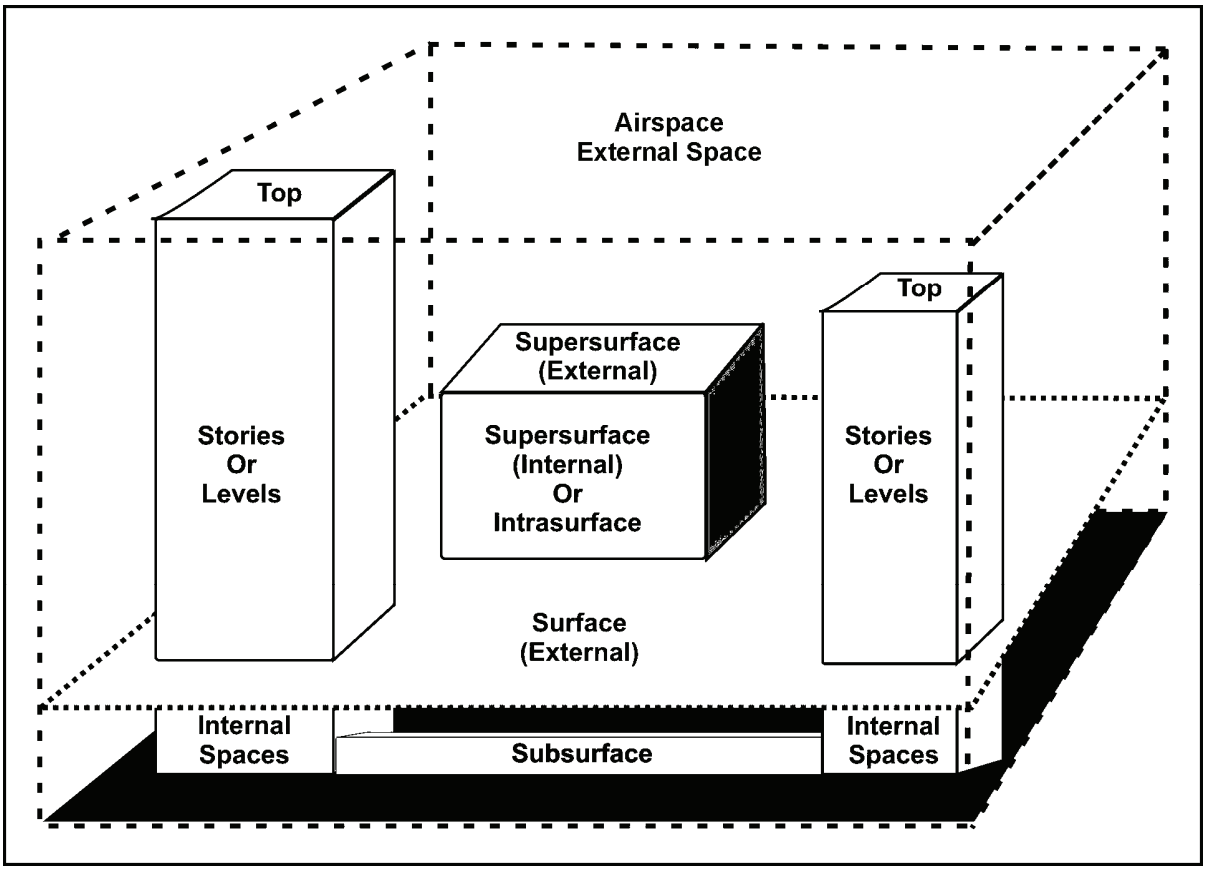


Figure 1-4. The multidimensional urban battlefield

1-28. **Supersurface and Airspace**. For analytical purposes, the supersurface and airspace consist of all areas above the surface level in an urban environment. These areas include the internal floors or levels (intrasurface areas), external roofs or tops of buildings, stadiums, towers, or other vertical structures, and the airspace. They can provide cover and concealment; limit or enhance observation and fields of fire; and restrict, canalize, or block movement. However, forces can move within and between intrasurface areas creating additional, although normally secondary, AAs. Buildings—

- Provide cover and concealment.
- Limit or increase observation and fields of fire.
- Canalize, restrict, or slow movement of forces, especially mechanized forces.
- Can adversely affect the employment of Special Operations Forces (SOF) and airmobile insertion of infantry due to the number of powerlines, clotheslines, antennas, and other obstructions that may exist, especially on rooftops.

1-29. Provide optimal locations (via roofs and intrasurface areas) with excellent cover and concealment for snipers, lightweight, handheld antitank weapons, and Manportable Air Defense Systems (MANPADS), enabling top-down attacks against the weakest points of armored vehicles and unsuspecting aircraft.

1-30. Engineers must provide an analysis of buildings for their structural integrity and obstacles. Such obstacles include electrical wires, antennas, and enemy emplaced mines (although personnel may be inserted by jumping, rappelling, or fast roping from a hovering helicopter and extracted by hoist mechanisms). Rooftops may offer ideal locations for landing helicopters for employment of anti-helicopter mines. Some rooftops are designed as helipads. Overall, elevated firing positions reduce the value of any cover in surrounding open areas and permit engagement at close range without risk of immediate close assault. The supersurface and subsurface dimensions require commanders to think, plan, and execute ground operations vertically as well as horizontally. The complex terrain aspects of urban operations share strong similarities with mountain operations. (See FM 3-97.6.)

1-31. Aircraft and aerial munitions use the airspace as rapid air avenues of approach in urbanized areas. Forces can use aviation assets for observation and reconnaissance, aerial attack, or high-speed insertion and extraction of Soldiers, supplies, and equipment. Some surface obstacles, such as rubble, do not affect aviation assets. However, buildings of varying height and the increased density of towers, signs, power lines, and other urban constructions create obstacles to flight and the trajectory of many munitions (masking). These obstacles can limit low-altitude maneuverability in the urban airspace. Excellent cover and concealment afforded enemy gunners in an urban area increase aviation vulnerability to small arms and MANPADS, particularly when supporting ground forces.

1-32. **Surface.** FM 3-06 defines surface areas as exterior ground level areas such as parking lots, airfields, highways, streets, sidewalks, fields, and parks. For purposes of analysis, the ground floor of buildings should also be considered as part of the surface dimension. Because ground vehicles can directly access a structure's ground floor, analysts must consider them part of the surface dimension. Analysts must also consider the surface of waterways as part of the surface dimension.

1-33. Streets often provide primary AAs and the means for rapid advance. However, buildings and other structures often canalize forces moving along them. As such, obstacles on urban surface areas usually have more effect than those in open terrain since bypass often requires entering and transiting buildings or radical changes to selected routes. Where urban areas abut the ocean or sea, large lakes, and major rivers, the surface of these bodies of water may provide key friendly and threat AAs or essential LOCs and, therefore, may be a significant consideration for Army commanders. As such, amphibious and river-crossing operations may be an integral part of the overall urban operation.

1-34. Larger open areas—such as stadiums, sports fields, school playgrounds, and parking lots—are often critical areas during urban operations. They can provide locations for displaced civilians, interrogation centers, and enemy prisoner of war (EPW) holding facilities, and detainee holding areas (DHAs). These areas also can afford suitable aircraft landing zones (LZs) and pickup zones (PZs) and artillery firing locations. They can provide logistic support areas and aerial resupply possibilities because they are often centrally located.

1-35. **Subsurface.** These areas are below surface level. This dimension includes areas both below the ground and below water. (For example the Han River is a major AA in Seoul and can be infiltrated at the surface level or subsurface level.) These areas may serve as secondary and, in fewer instances, primary AAs at lower tactical levels. When thoroughly reconnoitered and controlled, they offer excellent covered and concealed LOCs for moving supplies and evacuating casualties. These areas may also provide sites for caching and stockpiling supplies.

1-36. Subsurface areas include the subways, tunnels, sewers, drainage systems, cellars, civil defense shelters, and other various underground utility systems. In older cities, they may include ancient hand-dug tunnels and catacombs. Both attacker and defender can use subsurface areas to gain surprise and maneuver against the rear and flanks of a threat and to conduct ambushes. However, these areas are often the most restrictive and easiest to defend or block. Their effectiveness depends on superior knowledge of their existence and overall design. Army commanders and analysts may need to consider potential AAs afforded by the subsurface areas of rivers and major bodies of water that border urban areas. This particularly

applies when operating as part of a joint task force (JTF) task organized with SOF or when opposing a threat with similar capabilities.

Mobility Corridors

1-37. Each element of the urban environment's multidimensional battlefield identified in figure 1-4 may be used as AAs, mobility corridors, and LOCs. They are predominantly used as mobility corridors within a larger AA. The mobility corridors (supersurface [to include air], surface, and subsurface) are used individually, in any combination, or simultaneously. In the urban environment, multiple vertical mobility corridors can combine in a horizontal AA. Finally, their use as mobility corridors, either in offensive or defensive roles, can trigger other battlefield effects (either lethal or non-lethal) across any or all dimensions. For example, Soldiers may move from the roof of one building to that of another. Depending on the exact location of the Soldiers involved, they may acquire an extended line of sight, be subjected to increased dead spaces, or just the opposite, be able to establish an engagement area. This situation is enhanced if multiple mobility corridors are opened (for example, simultaneous attacks from rooftops, through interior walls, along the street, and through access tunnels).

During Israeli operations against the Palestine Liberation Organization (PLO) in the summer of 2002, Israel Defense Force (IDF) commanders found that casualties were reduced and operations conducted more efficiently if Soldiers breached the outer walls of structures and entered buildings on their interior floors. This is an example of reducing an obstacle and creating a mobility corridor.

Avenues of Approach

1-38. FM 1-02 states that an AA is "an air or ground route of an attacking force of a given size leading to its objective or to key terrain in its path." Within a single urban AA, there may literally be hundreds of mobility corridors. This level of complexity will require analysts to develop (through extensive analysis) a thorough understanding of the size, pattern, and types of maneuver space available in their AOI.

Lines of Communication

1-39. All key LOCs bordering on or within the urban environment must be identified. Analysts must consider obstacles and rubble that may reduce mobility within a given LOC. LOCs include all routes (land, water, and air) that connect an operating military force with a base of operations and along which supplies and military forces move. The advent of digital communications has further expanded this definition to reflect telegraph and telephone lines, cell phones, radio (all types), television, digital satellite links, the Internet, data passed to and from other satellite systems (signals intelligence [SIGINT] and global positioning system [GPS]), and laser communications.

1-40. In the larger cities, manmade LOCs may include hundreds of streets, alleys, rail lines, subways, tunnels, and even canals. Analysts must prioritize their effort by focusing on those LOCs most critical to mission success. They must identify key LOCs as they apply to friendly, enemy, and the civilian population.

1-41. LOCs often cross terrain that is relatively impractical for off-road vehicular traffic and as such are heavily dependent on bridges, ramps, and overpasses. If these support systems (choke points) can be destroyed, damaged, or blocked, the LOCs may become useless. LOC trafficability estimates must consider information from all available sources to include reconnaissance reports, imagery, and combat assessments.

Engagement Areas

1-42. An engagement area is "an area where the commander intends to contain and destroy an enemy force with the massed effects of all available weapons and supporting systems." (FM 1-02) In the multidimensional urban environment, defenders can position forces in protected and mutually supportive positions. This allows defending forces to maximize the effects of their combat power in the complex terrain.

1-43. Engagement areas can be located almost anywhere in the urban environment from narrow streets, turns in a road, "T" intersections in roads, bridges, tunnels, split-level roads, open-city squares or plazas, rubbled areas, individual buildings, or even individual floors in buildings. Engagement areas can also be created in less obvious locations by using demolitions or mines or other obstacles which can shape an engagement area by creating impassable (countermobility) obstacles in urban canyons as well as clearing fields of fire that may not otherwise be available.

1-44. Urban combat is often characterized by very short ranges and denser and smaller engagement areas. Relatively few well-positioned defenders can generate significant combat power. Without the positional advantage and the corresponding protective effects of the terrain, attacking forces often must mass numbers to achieve necessary combat power.

Line of Sight

1-45. Digital or analog communications LOCs have important line-of-sight issues. Depending on the situation, LOCs may or may not be affected by line-of-sight limitations. This may mean that because of an obstacle (hill or building) between two points, it may be impossible to acquire line of sight on a target or communications emitter. Failure to anticipate interference with line of sight can have catastrophic results. This occurred at Grozny where Russian forces were trapped among the city's taller buildings and lost their line of sight. Subsequently, they lost or experienced degraded communications with their supporting units. Line of sight also impacts observation and fields of fire. Finally, line-of-sight constraints within the urban environment are not one but three-dimensional (3D) and must be addressed from all directions, both vertically and horizontally.

1-46. Unmanned aircraft systems (UASs) can prove instrumental in overcoming many of the ground-based line-of-sight restrictions. During Israel's incursion into Lebanon in 1983, the IDF employed unmanned aerial vehicles as digital retransmission platforms, among other roles.

1-47. The use of satellite and landline communications may mitigate many line-of-sight problems. Satellite phones, such as International Maritime Satellite phones, tend to provide more consistent communications in urban areas. Additionally, "suitcase" digital, satellite, and burst transmission systems have proven effective in the urban environment. Some of these systems have the added capability of allowing real-time imagery of selected targets to be passed to the user.

Structural Types

1-48. While the city's structures serve as the focal point of the inhabitant's work and living areas, religious or cultural facilities, and sports arenas, they may also be significant to military operations conducted there. Some of the most important structures and their importance are identified in table 1-3.

1-49. Today, especially in many third-world nations, the mix of new and old structures could create problems for any military force operating there. Ancient temples and fortifications may stand back-to-back with modern skyscrapers and high rise apartments. Port facilities, unique themselves, may stand next to the remnants of huge defensive walls that in turn may encircle all or part of the city.

Signal degradation is proportional to structural density, the height of the buildings, and other urban terrain factors. For purposes of audio and video line of sight (FM/UHF), the linear distances are less important than the structural density and disruption of the line of sight between given points. This means it is difficult to maintain consistent communications (for example, in the heart of a major metropolitan area) Even when the situation does not involve armed conflict, effective use of FM/UHF radios may be impaired by interference from trolley and other electrical lines. Some of these systems can generate up to 300 times the interference over normal atmospheric interference on the UHF band. Russian experience in Grozny showed that it was better to dedicate one radio to communicate with each separate subunit rather than to try communicating over a net. As for the use of wire-based systems, they are as they have always been, effective but susceptible to intrusion, damage, or destruction, especially in a large city where "digging them in" is not an option.

1-50. Structural composition is also important. Tank rounds fired into rooms occupied by snipers may pass all the way through buildings without exploding but in the process killing and wounding noncombatants in other rooms.

1-51. As another example, some of the ancient churches and other structures in the area, made of thick stone blocks, proved resistant to even heavy machine gun fire while the walls of more modern business and apartment complexes were easily penetrated by rifle fire and shrapnel.

1-52. Finally, there are differences in floor plans. Many structures, especially older ones, have intricate passageways, underground tunnels, exceptionally low or high ceilings, and other features not common in the United States. Local nationals—especially individuals that work in the buildings (for example, maintenance personnel), individuals involved in city planning, individuals having access to building plans, assistance from Combat Engineers, and other means—may prove valuable when obtaining information and conducting intelligence analysis on key structures.

1-53. Detailed information is usually required when planning and conducting operations on individual buildings. The degree of detail needed in such missions is reflected in table 1-4. The design and construction of buildings within a particular urban area are influenced by numerous factors to include climate, materials available, function, and cultural development of the region. Combat Engineers can usually provide information on the key characteristics of a building. Some of these key characteristics may be—

- Relative protective value offered by building construction materials. (Appendix B provides a general evaluation of small arms and light weapons effects against some common urban construction materials.)
- Level of force required to breach a building's external and internal walls, roof, or floors.
- Availability of internal LOCs.
- Potential fire hazards.

Table 1-3. Some key urban structural types

Structural Type	Importance
Churches, hospitals, medical facilities, and cemeteries.	These are protected places under the Geneva Conventions and usually declared "No-Fire Areas." However, intelligence which indicates the misuse of these and other protected places may make them lawful targets. Additionally, the location of hospitals is important planning information for both civilian and military casualties.
Sewer systems, subways, underground water systems, elevated railways, utilities, mass transportation routes.	Underground systems can provide infiltration routes. Elevated systems and mass transit routes provide exposed LOCs between city sectors while also offering points for good observation and fields for fire. Utility facilities are key targets for insurgents, terrorists, and others; their destruction can hinder the capabilities of defending forces, destabilize an area and affect the civilian population.
Stadiums, sports fields, playgrounds	Provides excellent DHAs. Can be used as helipads, sheltered petroleum, oils, and lubricants (POL), and ammunition storage areas.
Public baths, swimming pools, cisterns and reservoirs	Serves as an alternate water source in case public water supplies break down. Allows water for washing and other sanitary needs.
Construction sites, lumber yards, other commercial operations	Can serve as machine repair, obstacle construction facilities and material, and supports general engineer operations.
Hazardous material, industrial manufacturing and storage facilities, and other work and installations containing dangerous forces.	Presents a hazard to both sides in an operation and must be accounted for. Dams, dikes, levies, and nuclear or electrical generating stations need to be protected from attack. The attack or destruction of these facilities can cause excessive civilian injury or damage by the release of dangerous forces.
Purpose-built fortifications	Can range from fortresses built by the Crusaders through modern underground facilities built to survive the Cold War's nuclear scare. The build of these, however, will be of the period 1870-1914. They may include both missiles and heavy caliber weapons and may pose a variety of threats to any military force.

Table 1-4. Example information requirements for individual buildings

General Building Information
- ■ Provide general building information.
  - ❑ Location.
  - ❑ Type.
  - ❑ Number of stories.
  - ❑ Date of construction.
  - ❑ Type of building construction.
  - ❑ Ownership.
  - ❑ Occupants.
- ■ Obtain building blueprints or documents.
- ■ Obtain photographs or other imagery of the outside of the building and surrounding area.
- ■ Identify individuals with knowledge of the building interior (building engineer, building maintenance personnel, other.).
- ■ Note the general proximity to other structures.

Identify Building Specifications
- ■ Identify building dimensions.
- ■ Identify the external and internal doors.
  - ❑ Location.
  - ❑ Dimensions.
  - ❑ Type of material.
  - ❑ Composition.
  - ❑ Windows.
  - ❑ Location of hinges.
  - ❑ Method of opening (do the doors open outwards or inwards?)
  - ❑ Locks.
- ■ Identify windows.
  - ❑ Locations.
  - ❑ Type of construction materials.
  - ❑ Dimensions.
  - ❑ Method of locking.
  - ❑ Do the windows open in, out to the side, or up and down?
  - ❑ Mouse-holes.
    - Location.
    - Dimensions.
- ■ Identify hallways.
  - ❑ Location.
  - ❑ Width.
  - ❑ Length.
  - ❑ Number of doors.
  - ❑ Overhead openings.
  - ❑ Areas the hallway connects.
- ■ Identify closet spaces.
  - ❑ Location.
  - ❑ Dimensions.
  - ❑ Method of opening.
- ■ Identify crawl spaces.
  - ❑ Location.
  - ❑ Dimensions.
  - ❑ Openings.
  - ❑ Description.
- ■ Identify basements/cellars.
  - ❑ Location of entrance.
  - ❑ Staircase location.
  - ❑ Dimensions.
  - ❑ Use.
- ■ Identify attic spaces.
  - ❑ Location.
  - ❑ Location of staircase.
  - ❑ Dimensions.
  - ❑ Use.
  - ❑ Field of view from the attic.
- ■ Identify ventilation system.
  - ❑ Location.
  - ❑ Exhaust fans.
  - ❑ Pipes.
  - ❑ Chimney.
    - Location.
    - Dimension.
    - Composition.
    - Opening inside.
- ■ Identify stairwells.
  - ❑ Location.
  - ❑ Type.
- ■ Identify roof.
  - ❑ Size.
  - ❑ Material.
  - ❑ Access to interior.
  - ❑ Obstructions.
- ■ Identify elevators.
  - ❑ Location.
  - ❑ Dimensions.
  - ❑ Location of control box.
  - ❑ Mechanism for opening elevator inside shaft.
  - ❑ Maintenance access routes.
- ■ Describe the subterranean spaces.
  - ❑ Sewers.
  - ❑ Subways.
  - ❑ Basements/cellars.
  - ❑ Other utility tunnels
- ■ Examine the building's utility and communication systems.
- ■ Determine types of utilities used in the building.
- ■ Determine whether utilities can be regulated from outside the building.
- ■ Locate the utility control box or switches.
- ■ Identify the building's telephones.
  - ❑ Location.
  - ❑ Number.
  - ❑ Type.
- ■ Describe other means of communication.
  - ❑ Radios.
  - ❑ Internet.
  - ❑ Cell phones.

Table 1-4. Example information requirements for individual buildings (continued)

■ Examine building construction. ❑ Pattern of construction. ❑ Composition of the outer wall (whether small arms will penetrate). ❑ Composition of inner walls. - Whether small arms will penetrate.	- Whether walls are reinforced. ❑ Support structure. ❑ Insulation used in the walls (whether it is flammable).

1-54. Non-US Small Arms and Light Weapons Effects in the Urban Environment. Understanding the potential effects of threat (non-US) small arms and light weapons on structures and materials commonly found in the urban environment can be extremely important for planning purposes. Appendix B lists some common structural materials found in urban environments and the relative amount of protection that structures made of these materials will provide Soldiers being fired upon by select threat weapons systems.

WEATHER

1-55. Terrain analysis and weather analysis are inseparable in most situations. Operations in the urban environment, however, present some unique concerns. Inclement weather can affect the availability of food supplies. Mass demonstrations use good weather to get maximum turnout. Bad weather further degrades poor road networks. Rain and heavy winds may disrupt or stop a psychological operation (PSYOP) such as a leaflet drop. Some common considerations include—

- **Winds.** Wind patterns and effects are important concerns in nearly all environments; however, the larger urban areas offer some unique challenges that may otherwise be found only in rugged mountain areas. Depending on weather conditions, when compared with unrestricted terrain, the wind may be blocked, reduced, or enhanced in areas bordered by large structures. These in turn may cause a buildup of smog (or lethal chemicals if present), enhance the fire threat, restrict the use of helicopters (swirling winds), and others. These factors will make downwind predictions for CBRN and toxic industrial materials (TIMs) difficult. (See the Health Issues section in Chapter 2). Finally, there may be radical temperature changes associated with the combination of wind, precipitation, and structures (tunnels, high rises). Urban operations during cold and wet periods may be significantly affected by the wind chill factor.
- **Precipitation.** City engineers and urban sanitation workers are well aware of the artificial changes manmade structures make on the topography. Rain or melting snow often floods basements, underpasses, tunnels, sewers, and subway systems; streets become impassable with water, snow, or ice; and exposed or weathered electrical systems may short out. Chemical agents and TIM are washed into underground systems by precipitation. Some areas may in fact become impassable or "toxic corridors," and drinking water supplies may be affected. As a result, these systems may contain toxic concentrations higher than surface areas and become contaminated "hot spots." These effects become more pronounced as chemical agents and TIM are absorbed by brick or unsealed concrete sewer walls. Chemical detection and decontamination crews will be required when operating in these areas.
- **Visibility.** Visibility is critical at any time but even more so during operations in urban environments. Traditionally, night and periods of reduced visibility favor surprise, infiltration, detailed reconnaissance, attacks across open areas, seizure of defended strong points, and reduction of defended obstacles. There may be some areas where the tremendous amount of artificial and background light created in even the smallest urban areas puts unobserved movement at risk. The urban area's numerous structures, easily identifiable during the day, may not be so visible at night and enhance the problem of disorientation. Here technology enhancements may not only be desired but also be a necessity (night vision devices [NVDs] or GPS) for Soldiers operating there. Additionally, many urban areas are located along canals or

rivers which often create a potential for fog in low-lying areas. Industrial and transportation areas are the most affected by fog due to their usual proximity to waterways. In heavy industrial areas, smog can also limit visibility under all light conditions. Both fog and smog can affect ground operations by limiting illumination and reflective heating as well as degrading many target acquisition systems and limiting the use of infrared-guided artillery rounds and general aviation.

- **Cloud Cover.** In the urban environment, cloud cover can have some significant tactical effects. In addition to visibility effects as stated above, cloud cover above an urban area may combine with shadows from buildings to affect observation. Intermittent cloud cover may cause shadows on the ground which could confuse observers. Low cloud cover over urban areas can restrict air operations due to the numerous vertical manmade obstructions in these areas.
- **Temperature and Humidity.** Air inversion layers are common over cities, especially cities located in low-lying "bowls" or river valleys. Inversion layers may trap dust, pollutants, or even chemical agents and reduce visibility. These layers can also create a greenhouse effect which may cause a rise in ground and air temperature. The heating of buildings during the winter and the reflection and absorption of summer heat make built-up areas warmer than surrounding open areas during both summer and winter. This difference can be as great as 10 to 20 degrees and may significantly add to the problems faced in urban operations. Summer heat, combined with the very physical requirement of urban combat, can cause severe heat exhaustion problems and in the winter Soldiers may fall victim to exposure in nominally protected areas such as tunnels or causeways. Changes in temperature as a result of air inversions can also affect thermal sights during crossover periods of warm to cold and vice versa. Air inversions can also trap pollution, smoke from fires, or gases (such as tear gas) closer to the ground. This period should be identified, as it may differ from urban area to urban area. Extremely cold temperatures and heavily constructed buildings many affect target identification for thermal sights. For example, thick walls may make combat vehicle identification difficult by distorting hotspots, and increased use of heaters and warming fires may clutter thermal sights with numerous hotspots.

1-56. Before Soldiers are sent into an urban area, especially those with an urban center composed of numerous large structures, staff planners must have a good understanding of the weather and the effects of the weather in the urban environment. The staff weather officer (SWO) provides the basic weather forecasts for planning purposes.

SOCIETY (SOCIO-CULTURAL)

1-57. When local support is necessary for success, as is often the case in operations in the urban environment, the population is central to accomplishing the mission. The center of gravity (COG) of operations in urban environments is often human. To effectively operate among an urban population and maintain their goodwill, it is important to develop a thorough understanding of the society and its culture, to include values, needs, history, religion, customs, and social structure.

1-58. US forces can avoid losing local support for the mission and anticipate local reaction to friendly courses of action (COAs) by understanding, respecting, and following local customs when possible. The history of a people often explains why the urban population behaves the way it does. For example, US forces might forestall a violent demonstration by understanding the significance of the anniversary of a local hero’s death.

1-59. Accommodating the social norms of a population is potentially the most influential factor in the conduct of urban operations. Unfortunately, this is often neglected. Social factors have greater impact in urban operations than in any other environment. The density of the local populations and the constant interaction between them and US forces greatly increase the importance of social considerations. The fastest way to damage the legitimacy of an operation is to ignore or violate social mores or precepts of a

particular population. Groups develop norms and adamantly believe in them all of their lives. The step most often neglected is understanding and respecting these differences.

1-60. The interaction of different cultures during operations in the urban environment may demand greater recognition than in other environments. This greater need for understanding comes from the increased interaction with the civilian populace. Norms and values could involve such diverse areas as food, sleep patterns, casual and close relationships, manners, and cleanliness. Understanding these differences is only a start in developing cultural awareness.

1-61. Religious beliefs and practices are among the most important, yet least understood, aspects of the cultures of other peoples. In many parts of the world, religious norms are a matter of life and death. In many religious wars, it is not uncommon to find suicidal acts in the name of their god. In those situations, religious beliefs are considered more important than life itself.

1-62. Failure to recognize, respect, understand, and incorporate an understanding of the cultural and religious aspects of the society with which US forces are interacting could rapidly lead to an erosion of the legitimacy of the US or coalition mission. When assessing events, intelligence professionals must consider the norms of the local culture or society. For example, while bribery is not an accepted norm in our society, it may be a totally acceptable practice in another society. If US intelligence professionals assess an incidence of this nature using our own societal norms and values as a reference, it is highly likely that the significance of the event will be misinterpreted.

1-63. Some US military missions will require US forces to operate in support of the local government. While it is important to articulate US contributions to a given mission, it is also important to highlight the accomplishments of the local national government for long-term success. US military planners must identify key government officials early in the operation. These individuals can provide valuable information needed for successful completion of the operations to include city infrastructure, locations of enemy concentration, and a common picture of cultural norms.

1-64. Many developing country governments are characterized by nepotism, favor trading, sabotage, and indifference. Corruption is pervasive and institutionalized as a practical way to manage excess demand for city services. The power of officials is often primarily based on family and personal connections, economic, political or military power bases and age, and only after that on education, training, and competence.

1-65. A local government's breakdown from its previous level of effectiveness will quickly exacerbate problems of public health and mobility. Attempts to get the local-level bureaucracy to function along US lines will produce further breakdown or passive indifference. Any unintentional or intentional threat to the privileges of ranking local officials or to members of their families will be stubbornly resisted. Avoiding such threats and assessing the importance of particular officials requires knowledge of family ties.

1-66. US military planners must also recognize that the urban populace will behave according to their own self-interest. The urban populace will focus on the different interests at work: those of US/coalition forces, those of elements hostile to US/coalition forces, those of international/non-governmental organizations (NGOs) that may be present; those of local national “opportunities” and those of the general population. Friendly forces must be constantly aware of these interests and how the local national population perceives them.

1-67. Another significant cultural problem is the presence of displaced persons within an urban area. Rural immigrants, who may have different cultural norms, when combined with city residents displaced by urban conflict, can create a significant strategic problem. Noncombatants and refugees without hostile intent can stop an advancing unit or inadvertently complicate an operation. Additionally, there may be enemy troops, criminal gangs, vigilantes, paramilitary factions, and factions within those groups hiding in the waves of the displaced.

1-68. The enemy knows that it will be hard to identify the threat among neutral or disinterested parties. Local combat situations can change rapidly as the seeming neutrals become the threat within close quarters

and friendly forces find themselves suddenly in an indefensible position. Chechen rebels and the Hezbollah effectively used the cover of refugees to attack occupying forces and counted on heavy civilian casualties in the counterattack to gain support with the local population. The goal is to place incalculable stresses on the Soldiers in order to break down discipline and operational integrity. From Belfast to Lebanon, the constant pressure of identifying the threat amongst nonbelligerent or disinterested parties taxed and sometimes undermined rules of engagement (ROE), and in some cases, entire missions.

1-69. Defining the structure of the social hierarchy is often critical to understanding the population. Identifying those in positions of authority is important as well. These city officials, village elders, or tribal chieftains are often the critical nodes of the society and influence the actions of the population at large. In many societies, nominal titles do not equal power—influence does. Many "leaders" are figureheads, and the true authority lies elsewhere.

1-70. Some areas around the world are not governed by the rule of law, but instead rely upon tradition. Often, ethnic loyalty, religious affiliation, and tribal membership provide societal cohesion and the sense of proper behavior and ethics in dealing with outsiders, such as the US and/or coalition partners. It is important to understand the complicated inner workings of a society rife with internal conflict, although to do so is difficult and requires a thorough examination of a society's culture and history.

1-71. Every city has discrete and discernible patterns of daily activity. The time of rush hour activity along an LOC is one case in point. Business transactions, market sales, religious practices, governmental functions, and criminal activity are other examples of daily behavior that can be analyzed for consistencies. Disruptions or irregularities in these patterns serve as a warning that something is amiss in the city. Identifying and understanding trends and patterns of activity provide critical information for intelligence analysts and mission planners.

1-72. While certain patterns do exist, most urban centers are normally composed of a multitude of different peoples, each with their own standards of conduct. Individuals act independently and in their own best interest, which will not always coincide with friendly objectives. The presence or actions of the different population components of an urban area cannot be ignored when conducting mission planning. Treating the urban population as a homogenous entity can lead to false assumptions, cultural misunderstandings, and poor situational understanding.

POPULATION

1-73. A population of significant size and density inhabits, works in, and uses the manmade and natural terrain in the urban environment. Civilians remaining in an urban environment may be significant as a threat, an obstacle, a logistics support problem (to include medical support), or a source of support and information. The most significant problem regarding the local population is the fact each person is a potential threat and can participate in an insurgency, terrorism, or other disruptive activity.

1-74. One of the most violent examples in US military history was the Viet Cong. The Viet Cong laid mines and demolitions, conducted ambushes and sniping, performed information collection missions for Hanoi, and even participated in force-on-force engagements, primarily during the Tet Offensive in 1968. The difficulty for the US and allied forces operating there lay in the fact that the Viet Cong looked like their neighbors, often held jobs, and raised families in pro-government neighborhoods, and, in some cases, even served in the South Vietnamese Army.

1-75. Another consideration when dealing with the local population is their ability to hinder military operations. Regardless of causes or political affiliations, civilian casualties are often the focal point of press coverage, often to the point of ignoring or denigrating any previous accomplishments. Within the operational continuum, and especially during the conduct of urban operations, commanders can expect to encounter restrictions on their use of firepower and challenges in their ability to conduct sustainment missions. In the current operational environment, it is unacceptable to our leaders and the American population to inflict large numbers of civilian casualties.

1-76. Another issue is the local population's requirement for logistical and/or medical support. US troops deployed to Somalia and the Balkans immediately had to deal with providing logistic support to starving populations until local and international organizations could take over those functions. Disease and wounds were also a problem among the local population, most notably in Somalia, Haiti (disease), and Bosnia and Kosovo (wounds). The burden of caring for the locals was initially placed on the deployed commanders until local national and international organizations could establish treatment facilities.

1-77. From an intelligence standpoint, the local population can be a valuable information source. This was especially effective during US operations in Bosnia and Kosovo when locals told of minefields, weapon caches, infiltration routes, mass burials, and other proof of war crimes.

1-78. Some of the key requirements to identify when analyzing the local population in an urban environment are shown in table 1-5.

Table 1-5. Example information requirements for populations

General Information

- ■ Identify the values of the urban population.
  - ❑ Family relations.
  - ❑ Religious values.
  - ❑ Political views.
  - ❑ Ethnic tribal ties.
  - ❑ Nationalism.
- ■ Identify the current issues/problems facing the urban population.
  - ❑ Economics.
  - ❑ Politics.
  - ❑ Religious conflict.
  - ❑ Crime.
  - ❑ Drug/alcohol addiction.
  - ❑ Ethnic strife.
  - ❑ Housing.
- ■ Assess the history of conflict in the state.
  - ❑ Internal and external.
  - ❑ Recent conflicts.
- ■ Describe the significance of the urban area.
  - ❑ International.
  - ❑ National.
  - ❑ Religious.
  - ❑ Military.
  - ❑ Economic.
  - ❑ Historical.
- ■ Identify key figures in the society.
  - ❑ Government leaders.
  - ❑ Religious leaders.
  - ❑ Military leaders.
  - ❑ Opposition leaders.
  - ❑ Tribal chiefs/elders.
  - ❑ Crime/drug figures.
  - ❑ Other.
- ■ Identify the extent (if any) of anti-American sentiment in each of the following:
  - ❑ Individuals.
  - ❑ Society's privileged.
  - ❑ Lower class.
  - ❑ Government.
  - ❑ Military.
  - ❑ Extremists.
  - ❑ The media.
- ■ Evaluate the city by geographic locations.
  - ❑ Slums/shantytowns.
  - ❑ Areas where criminal gangs operate.
  - ❑ Areas of the city where US/coalition forces are likely unwelcome.
  - ❑ Areas in the city where demonstrations/riots typically occur.
- ■ Identify the social aspects/traits of the urban population.
  - ❑ Family structure.
  - ❑ Role of elders.
  - ❑ Role of men.
  - ❑ Role of women.
  - ❑ Role of children.
  - ❑ Opposite sex interaction.
  - ❑ Same sex interaction.
  - ❑ Significance of pets and animals.
  - ❑ Eating habits.
  - ❑ Sanitary practices.
  - ❑ Alcohol/drug use.
  - ❑ Firearm ownership.
- ■ Identify the influence of the media.
  - ❑ By form (print, radio, television).
  - ❑ By origin (local, national, international).
  - ❑ Media bias.
  - ❑ Group(s) or individuals that control the media.
  - ❑ Key media personnel.
- ■ Identify taboos or insulting social actions.
  - ❑ Verbal.
  - ❑ Non-verbal (body gestures/manner of dress).
- ■ Identify significant dates.
  - ❑ Importance.
  - ❑ Dates or holidays significant to one portion of populace but offensive to another
  - ❑ Effect on city.
  - ❑ Violence.
  - ❑ Demonstrations.
  - ❑ Types of celebrations.
  - ❑ Number of participants.

Table 1-5. Example information requirements for populations (continued)

- ■ Identify cultural landmarks and structures.
  - ❑ Location.
  - ❑ Type.
  - ❑ Religious.
  - ❑ Historical.
  - ❑ Stadiums.
  - ❑ Shopping centers.
  - ❑ Other.

Demographics

- ■ Assess the urban area's demographics.
  - ❑ Ethnicity.
  - ❑ Race.
  - ❑ Religion.
  - ❑ Economic status.
  - ❑ Political affiliation.
  - ❑ Other.
- ■ Identify languages spoken.
  - ❑ Official.
  - ❑ Social.
  - ❑ Business.
  - ❑ Dialects.
  - ❑ Slang.
- ■ Identify the urban population/population density.
  - ❑ Total.
  - ❑ By city area.
  - ❑ Center city.
  - ❑ Residential.
  - ❑ Slum/shantytown.
  - ❑ Area of operations.
- ■ Identify the age structure.
  - ❑ Males and females age 0-14.
  - ❑ Males and females age 15-64.
  - ❑ Males and females age 65 and older.
  - ❑ Males age 15-49 (potential military age).
- ■ Identify the trends in migration.
  - ❑ Number of migrants.
  - ❑ Cause(s) of migration.
  - ❑ Average age of migrants.
  - ❑ Refugee situation.
  - ❑ Origin of the refugees.
  - ❑ Size of the refugee population.
  - ❑ Size of the original population.
- ■ Describe the relationship between refugees and the city populace.
  - ❑ Supporting.
  - ❑ Hostile.
  - ❑ Indifferent.
- ■ Identify segments of the population that fled the city.
  - ❑ Cause.
  - ❑ Region of resettlement.
  - ❑ Circumstances that will afford their return.
- ■ Identify the population of the rural areas surrounding the urban area.
  - ❑ Numbers.
  - ❑ Location and distance from urban area.
  - ❑ Relationship to/with urban population.
  - ❑ Travel.
  - ❑ Employment.
  - ❑ Interdependence
  - ❑ Role in conflict (if any).

Social Structure

- ■ Identify the ethnic structure.
  - ❑ Percent of population by ethnic group.
  - ❑ Physical boundaries of influence.
  - ❑ Dominant ethnic group (if any).
  - ❑ Reason for dominance.
  - ❑ Biases of the groups.
  - ❑ Role of ethnicity in conflict (past and present).
  - ❑ Key personnel and location.
- ■ Identify the racial structure.
  - ❑ Percentage of population by race.
  - ❑ Dominant racial group (if any).
  - ❑ Reason for dominance.
  - ❑ Physical boundaries of influence.
  - ❑ Biases of the races.
  - ❑ Role in conflict.
  - ❑ Key personnel and location.
- ■ Identify the religious structure.
  - ❑ Beliefs.
  - ❑ Percentage of population.
  - ❑ Importance/influence in society.
  - ❑ Practices.
  - ❑ Physical boundaries of influence.
  - ❑ Biases.
  - ❑ Dominant religious group (if any).
  - ❑ Reason for dominance.
  - ❑ Role of religion in conflict.
  - ❑ Key personnel and location.
- ■ Identify the tribal/clan structure.
  - ❑ Basis of affiliation.
  - ❑ Percentage of population.
  - ❑ Physical boundaries of influence.
  - ❑ Dominant tribe/clan (if any).
  - ❑ Reason for dominance.
  - ❑ Biases of the tribes/clans.
  - ❑ Role in conflict.
  - ❑ Key personnel and location.
- ■ Identify the economic class structure.
  - ❑ Distribution of wealth.
  - ❑ Per capita income.
  - ❑ Percentage of population by economic sector (industry, service, other.).
  - ❑ Percentage of population living in poverty.

Table 1-5. Example information requirements for populations (continued)

- ❑ Percentage of population dependent on economic aid.
- ❑ Type of aid.
- ❑ Unemployment rate.
- ❑ Underemployment rate.
- ❑ Status of trade unions.
- ❑ Whether membership in the unions is compulsory.
- ❑ Influence of unions in the urban area (politically, economically, other.).
- ❑ Key union personnel and location.
- ❑ Management class.
  - Management class influence in the urban area.
  - Key management class personnel and location.
- ❑ Economic elite.
  - Economic elite influence in the urban area.
  - Key economic elite personnel and location.
- ❑ Physical boundaries based on economics.
- ❑ Role of economics in the conflict.

■ Identify the political structure.
- ❑ Political parties/political factions.
- ❑ Percent of population belonging to a political faction or party.
- ❑ Dominant political party (if any).
- ❑ Reason for dominance.
- ❑ Political factions, parties, or beliefs. in the urban area.
- ❑ Voting practices.
  - Suffrage.
  - Election turnout.
  - Election fraud.
  - Other voting irregularities.
- ❑ Physical boundaries based on political beliefs.
- ❑ Boundary overlap/possible areas of friction.
- ❑ Key leaders/personnel and location.
- ❑ Role of politics in conflict.
- ❑ Issues motivating the political behavior of each segment of society.
  - Economic benefits.
  - Social prestige.
  - Ethnic ties.
  - Religious affiliation.
  - Other.

■ Identify the city government structure.
- ❑ Executive branch.
- ❑ Legislative branch.
- ❑ Judicial branch.
- ❑ Key personnel and location.
- ❑ Administrative divisions.
- ❑ Physical boundaries of administrative divisions.
- ❑ Whether officials are elected or appointed.
- ❑ Extent of the local government's authority.

■ Determine whether the urban area is the seat of the national government.
- ❑ Branches of the national government in the urban area.
- ❑ Relationship between city and national governments.
- ❑ Key personnel and location.

■ Identify the educational structure.
- ❑ Literacy (percentage of total population, over age 15, male, female).
- ❑ Whether education is tuition-free and to what level.
- ❑ Percentage of total population by education level (pre-school/kindergarten, primary, secondary, university/college, post-graduate).
- ❑ Education level by sex.
- ❑ Education level by type (academic, technical/vocational).
- ❑ Whether access to education is based on class or other social affiliation.
- ❑ Effect that the conflict has had on education

■ Identify the presence of non-governmental organizations (NGOs) in the urban area of operations.
- ❑ Organizations name/country affiliation.
- ❑ Types of services provided.
- ❑ Food.
- ❑ Medical.
- ❑ Infrastructure.
- ❑ Education.
- ❑ Government service.
- ❑ Religious indoctrination.
- ❑ Organization's agenda or cause.
- ❑ Influence on the population.
- ❑ Organization's structure.
- ❑ Key personnel.
- ❑ Host government liaisons.
- ❑ Organization's security concerns.
- ❑ Relationships between NGOs.

■ Assess the sentiments of the urban population toward the various authorities (examine among the various ethnic, racial, class, and factional groups).
- ❑ Popular support for the local and national government.
- ❑ Popular support for the government's military forces.
- ❑ Popular support for the US/coalition government.
- ❑ Active/passive.
- ❑ Violent/nonviolent.
- ❑ Criteria that would change posture.

Table 1-5. Example information requirements for populations (continued)

❑ Popular support for US/coalition military forces. - Active/passive. - Violent/nonviolent. - If coalition, posture by country. - Factors that would change local support. ▪ Actions US forces could take to gain maximum local support. ▪ Actions to avoid. ■ Examine local law enforcement capabilities to include the ability to accomplish the following: ❑ Enforce export laws. ❑ Protect persons/property/environment. ❑ Interdict illegal aliens. ❑ Enforce immigration laws. ❑ Maintain arms control. ❑ Prevent narcotics traffic and use. ❑ Prevent terrorism. ■ Identify types of identification required or used in the urban area. ❑ National. ❑ Passport/visa. ❑ Local.	❑ Government service. ❑ Military. ❑ Driver's license. ❑ Professional/trade/union. ❑ Photo IDs. - Requirements. - Offices and locations where issued. - Forgeries in use. ■ Evaluate air/sea/land customs procedures. ❑ Enforcement. ❑ Susceptibility to bribery. ❑ Evaluate border crossing procedures. - Checkpoints. - Foot/vehicle patrols. - Aircraft. - Searches. - Documents. - Security. - Other.

POPULATION IMPACTS ON THE MISSION

1-79. Although the population is not a part of the terrain, the populace can impact the mission in both positive and negative ways. Individuals or groups in the population can be co-opted by one side or another to perform a surveillance and reconnaissance function, performing as moving reconnaissance to collect information. City residents have intimate knowledge of the city. Their observations can provide information and insights about intelligence gaps and other activities that help reach an understanding of the environment. For instance, residents often know about shortcuts through town. They might also be able to observe and report on a demonstration or meeting that occurs in their area.

1-80. Unarmed combatants operating within the populace or noncombatants might provide intelligence to armed combatants engaged in a confrontation. This was readily apparent in Mogadishu, where unarmed combatants with the ability to observe friendly force activities without the threat of being engaged instructed hidden threat forces on where to fire.

1-81. The presence of noncombatants in a combat zone can lead to restrictive ROE which may impact the way in which a unit accomplishes its mission. The population, groups or individuals or sectors within an urban area can be the target audience of information operations. Specific individuals may provide a means to approach a specific target audience when acting as a mouthpiece for an information operation.

1-82. Populations present during urban operations can physically restrict movement and maneuver by limiting or changing the width of routes. People may assist movement if a group can be used as human barrier between one combatant group and another. Refugee flows, for example, can provide covert infiltration or exfiltration routes for members of a force. There may also be unintended restrictions to routes due to normal urban activities which can impact military operations. For example, movement may be impeded by normally heavy traffic during rush hours as people head to work or return home. Another example would be a route that goes through a market in town that is closed to traffic only on market days, but otherwise normally open to unimpeded traffic flow.

1-83. One of the largest challenges to friendly operations is the portion of the population that supports the adversary. Even people conducting their daily activities may inadvertently "get in the way" of any type of operation. For example, curiosity-driven crowds in Haiti often affected patrols by inadvertently forcing units into the middle of the street or pushing them into a single file. While no harm was inflicted, the unit was made more vulnerable to sniper and grenade attacks.

1-84. Captured combatants or a well-informed noncombatant can provide valuable intelligence about the enemy. These individuals can be extremely important to the success of military operations. Information from these sources, however, must be evaluated for accuracy and reliability before being acted upon. The person providing the information may be intentionally providing disinformation in order to negatively impact friendly operations or even simply be intended to manipulate friendly forces into conducting operations that are aimed at a personal grudge rather than influencing the military situation.

1-85. Strategically, the world audience, as well as its local contingent, can create political, cultural, and ideological impediments to a mission. Friendly forces must evaluate the local population and its potential effects on operations based on an understanding of the local culture, norms and behaviors—not on the accepted standards of the home countries of the friendly forces. Friendly forces can then tailor their activities to achieve the desired effects while avoiding unintended consequences that could even result in mission failure.

1-86. The American audience watching events unfold in Vietnam could have been perceived as an impediment to the US government's strategy of pursuing its strategic objectives. The cultural differences apparent when US forces were deployed for Operation Desert Storm could have been an impediment if not adequately addressed. For instance, a PSYOP flier produced to encourage a sense of unity among the Arab populations included pictures of two men holding hands—a sight not common in Western cultures. A flier designed in accordance with Western standards might not have been as effective.

1-87. Civilian populations can also provide infiltration or exfiltration routes for non-uniformed forces. These forces operating in any urban terrain can instantly blend into any type of crowd or activity. Threat forces can be protected from firepower by operating within a neutral group. For example, during the December 1999 World Trade Organization demonstrations in Seattle, organized, unruly, and dangerous protestors "hid behind peaceful demonstrators, creating a situation where if [the Seattle police] were to be successful in countering their tactics, a larger number of people likely would have been hurt." *(Kim Murphy, "Anarchists Deployed New Tactics in Violent Seattle Demonstrations," Los Angeles Times, December 16, 1999.)*

INFRASTRUCTURE

1-88. The infrastructure of an urban environment consists of the basic resources, support systems, communications, and industries upon which the population depends. The key elements that allow an urban area to function are also significant to operations, especially stability operations and civil support operations. The force that controls the water, electricity, telecommunications, natural gas, food production and distribution, and medical facilities will virtually control the urban area. These facilities may not be located within the city's boundaries. The infrastructure upon which an urban area depends may also provide human services and cultural and political structures that are critical beyond that urban area, perhaps for the entire nation.

1-89. A city's infrastructure is its foundation. It includes buildings, bridges, roads, airfields, ports, subways, sewers, power plants, industrial sectors, communications, and similar physical structures. Infrastructure varies from city to city. In developed countries, the infrastructure and service sectors are highly sophisticated and well integrated. In developing cities, even basic infrastructure may be lacking. To understand how the infrastructure of a city supports the population, it needs to be viewed as a system of systems. Each component affects the population, the normal operation of the city, and the potential long-term success of military operations conducted there.

1-90. Military planners must understand the functions and interrelationships of these components to assess how disruption or restoration of the infrastructure affects the population and ultimately the mission. By determining the critical nodes and vulnerabilities of a city, allied forces can delineate specific locations within the urban area that are vital to overall operations. Additionally, military planners must initially regard these structures as civilian places or objects, and plan accordingly, until reliable information indicates they are being used for a military purpose.

1-91. Much of the analysis conducted for terrain and society can apply when assessing the urban infrastructure. For example, commanders, staffs, and analysts could not effectively assess the urban economic and commercial infrastructure without simultaneously considering labor. All aspects of the society relate and can be used to further analyze the urban work force since they are a sub-element of the urban society. Similarly, the OAKOC aspects used to evaluate terrain may also apply to the urban infrastructure, especially considerations of key terrain.

1-92. A city's infrastructure can directly support the military mission. Local airfields or ports are vital for sustained operations. Host country medical facilities can become vital when allied casualties are greater than organic medical capabilities can handle. Their continued functioning can also play a role in maintaining the good will of the local population. During stability operations and civil support operations, the maintenance of law and order (to include prisons) becomes vital to the welfare of the general population. Success in ensuring that law and order is maintained or reestablishing law and order will directly affect the general population's perceptions and possible support for US operations.

TRANSPORTATION

1-93. The transportation network is a critical component of a city's day-to-day activity. It facilitates the movement of material and personnel around the city. This network includes roads, railways, subways, bus systems, airports, and harbors. In modern cities, the transportation network supports rapid international travel, often via several avenues.

1-94. Developing cities often have little means of public transportation. Foot traffic, livestock, and bicycles represent main sources of travel in underdeveloped cities and compete for road space with more modern forms of transportation. Care must be taken not to disrupt the transportation system of a city. Securing air and seaports is imperative for follow-on forces and supplies, but there are many possible repercussions of securing all the transportation nodes and stopping all inter- and intra-city movement. While the US mission may be immediately facilitated, critical needs of the noncombatant populace could go unmet. (See table 1-6.)

Table 1-6. Example information requirements for transportation infrastructure

Airfields

General Airfield Information

- ■ Provide airfield location.
- ■ Provide airfield size.
- ■ Identify airfield type.
  - ❑ Civilian.
  - ❑ Military.
  - ❑ Joint.
- ■ Identify principal use.
- ■ Describe the construction.
- ■ Assess security.
- ■ Evaluate access.
- ■ Provide status of the airfield.
  - ❑ Operational.
  - ❑ Non-operational.
  - ❑ Auxiliary.
- ■ Identify the controlling authority.
- ■ Determine the effect that the suspension of flight activities of the airfield would have on the urban area and urban population.
- ■ Identify key terrain.
- ■ Locate blueprints of the airfield and its facilities.
- ■ Assess the airfield specifications/layout.
  - ❑ Airfield elevation.
  - ❑ Runways.
  - ❑ Identification.
  - ❑ Azimuth.
  - ❑ Length and width.
  - ❑ Surface, base, sub-base (material, thickness, condition).
  - ❑ Longitudinal grade.
  - ❑ Transverse grade.
  - ❑ Shoulders, clear areas, overruns (width, transverse, grade and surface material).
  - ❑ Lateral safety zones (width, transverse slope, obstacles.
  - ❑ End clear zones (length, maximum slope).
  - ❑ Approach zones (length, width, glide slope, obstacles).
  - ❑ Condition (ability to support aircraft weight).
  - ❑ Eight-digit grid coordinate for each end of runway.
- ■ Evaluate taxiways.
  - ❑ Identification.
  - ❑ Azimuth.
  - ❑ Length and width.
  - ❑ Grade.
  - ❑ Surface, base, sub-base (thickness).
  - ❑ Bearing capacity (pounds per square inch).
  - ❑ Shoulder and clear area (width, transverse grade, surface, obstacles).
  - ❑ Turn radii.
  - ❑ Condition (ability to support aircraft weight).
- ■ Evaluate parking and warm-up aprons.
  - ❑ Number and location.
  - ❑ Total area and individual area.
  - ❑ Description.
  - ❑ Total capacity.
- ■ Identify hardstands.
  - ❑ Number and location.
  - ❑ Aircraft capacity.
  - ❑ Description.
- ■ Identify hangars.
  - ❑ Number and location.
  - ❑ Type and material.
  - ❑ Condition.
  - ❑ Size.
  - ❑ Door descriptions.
- ■ Locate terminals.
  - ❑ Identify control tower and ground control approach (location and eight-digit coordinate).

Table 1-6. Example information requirements for transportation infrastructure (continued)

- ■ Evaluate navigational aids.
  - ❑ Condition.
  - ❑ Eight-digit grid coordinate.
- ■ Identify lighting aids.
  - ❑ Runways.
  - ❑ Flight-line.
  - ❑ Taxiway.
  - ❑ Terminal building.
- ■ Assess underground drainage system.
  - ❑ Location.
  - ❑ Condition.
- ■ Evaluate the airfield utility system.
  - ❑ Electrical power source.
    - Master switch.
    - Current characteristics.
    - Availability of emergency power.
    - Location of transformers.
  - ❑ Natural gas source.
  - ❑ Jet starting units or auxiliary power units
- ■ Outline the enemy air defense assets (if any).
  - ❑ Type.
  - ❑ Location.
  - ❑ Capabilities/limitations
- ■ Determine how the airfield is tied into the national or regional integrated air defense system.
  - ❑ Type of node.
    - Sector operations center.
    - Intercept operations center
    - Fighter airfield.
    - Auxiliary airfield.
- ■ Assess the airfield's daily operating procedures.
  - ❑ Normal operating hours of the airfield.
  - ❑ Most commonly used approach path.
  - ❑ Control procedures.
  - ❑ Primary language used by air traffic control personnel, ground support personnel, back-up personnel.
  - ❑ Flight schedules of airlines using the airfield.

Airfield Support Facilities

- ■ Identify communications facilities.
  - ❑ Location.
  - ❑ Type.
  - ❑ Equipment.
  - ❑ Capabilities/limitations.
- ■ Identify fuel storage facilities.
  - ❑ Location.
  - ❑ Jet fuel.
  - ❑ Aviation gas.
  - ❑ Jet oil.
  - ❑ Aviation oil.
  - ❑ Lubricants, manifolds, and filters.
  - ❑ Pipelines.
  - ❑ Above and below ground storage and capacity.
  - ❑ Pumps.
  - ❑ Fuel trucks.
- ■ Identify munitions storage areas.
  - ❑ Location.
  - ❑ Type.
  - ❑ Condition.
  - ❑ Security.
  - ❑ Explosives that can be handled.
  - ❑ Aircraft loading procedures.
- ■ Identify emergency facilities.
  - ❑ Location.
  - ❑ Type.
  - ❑ Equipment.
  - ❑ Capabilities/limitations.
- ■ Identify maintenance facilities.
- ■ Identify meteorological support facilities.
- ■ Identify administration buildings.
- ■ Identify housing facilities.
  - ❑ Type, location, and number.
  - ❑ Capability and condition.
  - ❑ Construction materials.

Airfield Security

- ■ Assess ground security forces.
  - ❑ Military.
  - ❑ Civilian.
- ■ Determine whether surveillance devices/means are deployed.
  - ❑ Types and locations.
  - ❑ Field of coverage and monitoring locations.
  - ❑ Operating times and frequencies.
- ■ Physical Security Measures.
  - ❑ Security Lighting.
  - ❑ Checkpoints.
  - ❑ Perimeter fences.
  - ❑ Internal fences.
  - ❑ Other physical security obstructions.

Other Considerations

- ■ Describe new construction at the airfield.
- ■ Locate obstructions to flight.
  - ❑ Vertical obstructions, not contained in published data, which pose a threat to helicopters or other aircraft at/under 50 feet above ground level (AGL).
  - ❑ Other obstacles to flight within 5 and 10 kilometers of the airfield.
- ■ Identify radar systems and associated equipment.

Table 1-6. Example information requirements for transportation infrastructure (continued)

Helicopter Landing Zones (HLZs)
- ■ Assess the LZ characteristics.
  - ❑ Location.
  - ❑ Dimensions
  - ❑ Landing points.
  - ❑ Capacity by type of aircraft.
  - ❑ Surface material.
  - ❑ Soil trafficability.
  - ❑ Obstacles (existing, reinforcing).
  - ❑ Slope (direction, degree).
  - ❑ Lighting conditions.
  - ❑ Prevailing winds.
  - ❑ Seasonal variations.
  - ❑ Thermal/updrafts.
  - ❑ Altitude above sea level.
- ■ Determine the characteristics of the approach and retirement lanes.
  - ❑ Altitude and heading.
  - ❑ Check and control points.
  - ❑ Obstacles.
  - ❑ Enemy dispositions.
- ■ Determine the characteristics of the adjacent terrain and exits.
  - ❑ Dominant buildings and terrain.
  - ❑ Routes of ingress/egress.
  - ❑ Relief and drainage.
  - ❑ Obstacles (existing, reinforcing).
- ■ Identify landmarks that can be used as navigation aids.
- ■ Determine the distance and direction from the designated objectives.
- ■ Identify escape and evasion routes.
  - ❑ Pickup points.
  - ❑ Routes to friendly areas.
  - ❑ Landmarks.
- ■ Determine whether the urban area canalizes movement to the LZ.
- ■ Identify buildings with rooftops that can be used for HLZs.
  - ❑ Location.
  - ❑ Dimensions.
  - ❑ Landing points.
  - ❑ Capacity by type.
  - ❑ Obstacles.
  - ❑ Building entrances (location, quantity).
- ■ Identify the threats in the vicinity of the HLZ.
  - ❑ Antiair threat.
    - Small arms.
    - RPGs.
    - MANPADS.
    - SAMs (mobile/fixed).
    - Antihelicopter mines.
    - Antiaircraft artillery (mobile/fixed).
  - ❑ Obstacles.

Roadways
- ■ Identify the routes in the urban area.
  - ❑ Highways.
  - ❑ Streets.
  - ❑ Alleys.
  - ❑ Trails.
  - ❑ Bike paths.
  - ❑ Pedestrian paths.
- ■ Identify street patterns.
  - ❑ Rectangular or chessboard.
  - ❑ Rayed.
  - ❑ Radial or radial-ring.
  - ❑ Contour forming.
  - ❑ Irregular pattern.
  - ❑ Combined pattern.
  - ❑ Linear pattern.
- ■ Determine the effect of roadway shut down.
- ■ Evaluate roadway use.
  - ❑ Traffic patterns.
  - ❑ Rush hour times.
  - ❑ Types.
  - ❑ Importance to economy.
  - ❑ Possible rerouting.
  - ❑ Method of traffic control.
- ■ Verify that the maps correspond with the routes.
- ■ Analyze critical roadways.
  - ❑ Roadway characteristics.
    - Width.
    - Surface material.
    - Base course.
    - Subgrade material.
    - Maximum wheel load.
    - Crown.
    - Maximum elevation.
    - Drainage.
  - ❑ Length.
    - Kilometers.
    - Miles.
  - ❑ Grades.
    - Location of grades exceeding 7 percent.
    - Maximum grade in percent.
  - ❑ Shoulders.
    - Material.
    - Width.
    - Slope.
    - Condition.
  - ❑ Curves.
    - Location.
    - Radius.
    - Slope.

Table 1-6. Example information requirements for transportation infrastructure (continued)

- ❑ Bridges.
  - Total number of segments.
  - Load bearing capacity.
  - Width.
- ❑ Culverts.
  - Location.
  - Type and number.
  - Construction material.
- ❑ Ditches.
  - Depth.
  - Width.
  - Side slope.
  - Condition.
- ❑ Median strips or dividers.
  - Material.
  - Width.
  - Height.
  - Obstructions.
  - Vegetation.
- ❑ Fords and ferries.
  - Location.
  - Dimensions.
- ❑ Tunnels, underpasses, and snowsheds.
  - Location.
  - Dimensions.
- ❑ Road parking areas.
  - Location.
  - Vehicle capacity.
  - Facilities.
  - Surface materials.
- ❑ Junctions or grade crossings.
  - Identification.
  - Location.
- ❑ Checkpoints and obstacles.
  - Location.
  - Determine whether location is favorable for ambush.

Railroads

General Railway Information

- ❑ Identify the number of trains that run daily.
- ❑ Type.
  - Passenger.
  - Freight.
- ❑ Fuel.
- ❑ Direction of travel.
- ❑ Destinations.
- ❑ Cargo and capacity.
- ❑ Rolling stock.
- ❑ Types of railcars and carrying capacity.
- ❑ Schedules.
- ❑ Special equipment.

Determine the effect of railway service interruption.

- ■ Locate key/critical points.
  - ❑ Type.
  - ❑ Location.
  - ❑ Choke points.
  - ❑ Vulnerabilities.
- ■ Locate and describe fixed installations.
  - ❑ Classification yards.
  - ❑ Service yards.
  - ❑ Freight/loading yards.
  - ❑ Passenger stations.
  - ❑ Freight stations.
- ■ Analyze the track specifications and railway layout.
  - ❑ Total length.
    - Urban.
    - Rural.
  - ❑ Type.
    - Gauge.
    - Rails.
    - Roadway.
  - Width.
  - Spacing.
  - ❑ Axle load limit.
  - ❑ Minimum clearances.
    - Horizontal.
    - Vertical.
  - ❑ Maximum grades.
    - Direction of travel.
    - Location.
  - ❑ Radius of the tightest curve.
    - Location.
    - Radius measurement.
  - ❑ Roadbed.
    - Material.
    - Total width.
    - Width of shoulders.
  - ❑ Ballast/sub-ballast.
    - Material.
    - Size.
    - Condition
    - Thickness.
  - ❑ Railheads.
    - Supply transfer points.
    - Characteristics (spurs, sidings, piles of material, wagons, tents, huts, guards, supply handlers).
  - ❑ End points.
    - System.
    - Route.
    - Segment.

Table 1-6. Example information requirements for transportation infrastructure (continued)

- Reason for end (change in number of tracks, change in gauge, crossing point, construction type and load bearing capacity, international borders).
- ❑ Ties.
  - Material.
  - Length.
  - Width.
  - Depth.
  - Spacing.
- ❑ Ditches.
  - Depth.
  - Width.
  - Side slope.
  - Lining.
  - Conditions.
  - Cross sections.
  - Structures.
- ❑ Stations.
  - Location.
  - Functions.
  - Facilities.
  - Command and control.
  - Security.
- ❑ Bridges.
  - Dimensions.
  - Characteristics.
- ❑ Culverts.
  - Characteristics.
  - Dimensions.
- ❑ Ferries.
  - Dimensions.
  - Characteristics.
- ❑ Tunnels, underpasses, and snowsheds.
  - Characteristics.
  - Dimensions.
  - Mainline junctions.
  - Location.
  - Identification of connecting lines.
  - Switch type.
- ❑ Crossovers.
  - Location.
  - Type switch.

■ Evaluate the railway support facilities.

- ❑ Freight handling facilities.
  - Location.
  - Side loading platforms.
  - End loading bays.
  - Sidings with access roads.
  - Freight sheds.
  - Turntables (number and diameter/transfer table length).
  - Cranes (number, type, and capacity).
- ❑ Repair shops/locomotive terminals.
  - Location.
  - Engine house and turntable.
- ❑ Manpower.
- ❑ Service facilities.
- ❑ Fuel facilities.
  - Location.
  - Type of fuel.
  - Storage and capacity.
  - Quantity of fuel on hand.
  - Method of loading.
- ❑ Electrical facilities.
  - End point of electrified sections.
  - Power feed.
  - Current characteristics.
  - Source of power.
- ❑ Command and control.
- ❑ Water facilities.
  - Location.
  - Service.
  - Type of storage.

■ Evaluate track maintenance.

- ❑ Maintenance and construction standards.
- ❑ Maintenance schedule
- ❑ Sections in need of repair.
  - Location.
  - Nature of repair.
  - Effort required to repair.
- ❑ Planned extensions or improvements.
  - Type.
  - Location.
  - Characteristics.

■ Identify signals and train control.

- ❑ Location.
- ❑ Type.

■ Determine whether the railroad follows any terrain features.

- ❑ Roadways.
- ❑ Waterways.
- ❑ Terrain.

■ Assess the safety and security features of the railroad.

Bridges

■ Identify general characteristics of the bridge.

- ❑ Location.
- ❑ Name and military designation.
- ❑ Structural type.
- ❑ General condition.
- ❑ Obstacle crossed.
- ❑ Significance.

Table 1-6. Example information requirements for transportation infrastructure (continued)

- ❑ Bridge specifications.
  - Length and width.
  - Capacity.
  - Military load classifications.
  - Under bridge clearance.
  - Horizontal and vertical clearance
- ■ Determine the result should the bridge be destroyed or blocked.
- ■ Evaluate alternate routes.
- ■ Determine the effort required to rebuild the bridge if destroyed.
- ■ Analyze the bridge layout.
  - ❑ Approaches.
  - ❑ Banks.
  - ❑ Bypasses.
  - ❑ Abutments/piers.
  - ❑ Spans.
  - ❑ Suspension system.
  - ❑ Intermediate supports.
  - ❑ Walkways.
  - ❑ Number of spans.
    - Type of control (mechanical, electronic).
    - Time required to move.
  - ❑ Characteristics of any movable spans.
  - ❑ Safety and security features.
  - ❑ Traffic control markings.

Subways

- ■ Assess the general layout of the subway system.
- ■ Determine how the disruption of subway service would affect the urban area and urban population.
- ■ Evaluate the general condition of the subway system.
  - ❑ Maintenance.
  - ❑ Safety.
  - ❑ Security.
- ■ Identify the train schedule.
- ■ Provide maps of the system.
  - ❑ Actual tracks.
  - ❑ Altered renditions of the lines and stations.
  - ❑ Copies of subway blueprints.
- ■ Determine how the subway is operated and managed.
- ■ Evaluate the subway specifications.
  - ❑ Entrances and exits to the system.
  - ❑ Pedestrian traffic routes.
  - ❑ Stairs, escalators, elevators.
  - ❑ Security obstructions (gates, turnstiles).
  - ❑ Maintenance and utility tunnels.
  - ❑ Drains.
  - ❑ Terminals.
  - ❑ Tunnels: dimensions and construction.
- ■ Describe rails.
  - ❑ Dimensions.
  - ❑ Construction.
- ■ Describe trains.
  - ❑ Type.
  - ❑ Speed.
  - ❑ Size and capacity of cars.
- ■ Describe rail bed.
  - ❑ Grade.
  - ❑ Subgrade.
  - ❑ Rail embedding: crossover sections/location.
  - ❑ Location of controls.
  - ❑ Turn and corner locations.
  - ❑ Manhole locations.
  - ❑ Electric source location.
- ■ Evaluate traffic patterns.
  - ❑ Daily number of passengers.
    - Weekday.
    - Weekend.
    - Holiday.
    - Rush hour.
  - ❑ Stations that receive the most traffic.
- ■ Evaluate the subway construction.
  - ❑ Type.
    - Typical subway near surface with flat roof and I-beams for roof and sides, supported between tracks with steel bulb-angle columns.
    - Flat-roof subway of reinforced concrete construction supported between tracks by steel bulb-angle columns, used for short distances.
    - Concrete-lined tunnel of open cutwork and rock tunnel work.
    - Elevated track on steel via duct.
    - Cast iron tubes used under water.
  - ❑ Layers of the inner subway construction.
  - ❑ Construction of beams and shafts.
  - ❑ Reinforcements that are part of the construction to add support and waterproofing (such as hard burned brick laid in hot asphalt).
  - ❑ Soil, rock, or compound that the tunnels are cut through.
  - ❑ Ventilation system.
  - ❑ How demolition in the subway would affect the urban area (surface structure, subterranean features).
- ■ Examine the subway security system.
  - ❑ Type of security.
  - ❑ Threats.
  - ❑ Vagrant population (if any) in the subway system.
    - Approximate numbers.

Table 1-6. Example information requirements for transportation infrastructure (continued)

- Primary locations/concentrations.
- Emergency response.
- Evacuation plan.

■ Evaluate the decibel level around the trains.

Ports and Harbors

General Information

■ Identify the local name and military designation.
■ Identify the port/harbor type.
■ Assess the general condition of the port/harbor.
■ Determine the importance of the port/harbor.
■ Identify operating data.
  ❑ Average tonnage.
  ❑ Administration.
  ❑ Labor resources.
■ Provide the total harbor area in acres.
■ Provide pilotage data.
■ Evaluate the importance of the port to the urban area.
  ❑ Effect of a port shutdown.
  ❑ Economic.
  ❑ Military.
■ Assess the adjacent terrain.
■ Assess port specifications/layout. Port capacity in metric tons per day.
  ❑ Civil/commercial.
  ❑ Military.
■ Determine the largest vessel that can be accommodated.
  ❑ Approaches (depth and width).
  ❑ Alongside berths.
  ❑ Anchorage.
  ❑ Free swinging berths.
  ❑ Vertical clearance.

Harbor Characteristics

■ Identify approaches and entrances to the harbor.
  ❑ Location.
  ❑ Width.
  ❑ Depth.
  ❑ Vertical clearance.
■ Identify harbor divisions.
  ❑ Designation.
  ❑ Location.
  ❑ Dimensions.
  ❑ Principal use.
  ❑ Characteristics.
  ❑ Controlling depth.
■ Identify harbor fairways.
  ❑ Location.
  ❑ Alignment.
  ❑ Radius of tightest turn.
  ❑ Shortest tangent.
  ❑ Controlling depth.
  ❑ Width.
  ❑ Overhead clearance.
  ❑ Susceptibility to silting.
■ Identify turning basins.
  ❑ Locations.
  ❑ Dimensions.
  ❑ Controlling depth.
■ Identify anchorages and free-swinging moors.
  ❑ Locations.
  ❑ Depth range.
  ❑ Holding ground.
  ❑ Protection afforded.
  ❑ Type and number of berths.
■ Identify fixed mooring berths.
  ❑ Locations.
  ❑ Numbers.
  ❑ Types.
  ❑ Buoys.
  ❑ General commercial berths.
  ❑ Tanker berths.
  ❑ Naval berths.
■ Identify obstructions.
  ❑ Overhead obstructions.
  ❑ Surface obstructions.
  ❑ Underwater obstructions.
■ Identify navigational aids.
  ❑ Location.
  ❑ Type.
  ❑ Condition.

Physical/Hydrographic Conditions

■ Identify the tides.
■ Identify tidal ranges.
■ Identify currents.
■ Identify water bioluminescence.
■ Identify breakwaters, moles, jetties, or sea walls.
■ Evaluate unusual geophysical conditions.
  ❑ Location.
  ❑ Type.
■ Determine the meteorological considerations.
■ Evaluate the debris in the water.
  ❑ Type.
  ❑ Volume.

Freight Handling Facilities/Equipment

■ Identify the principal wharf.
  ❑ Identification.
  ❑ Location.
  ❑ Normal use.
  ❑ Type and construction.
  ❑ Berth length.
  ❑ Depth.
  ❑ Depth alongside.
  ❑ Height of deck.

Table 1-6. Example information requirements for transportation infrastructure (continued)

- ❑ Total length.
- ❑ Standard berth class.
- ❑ Transit sheds.
- ❑ Fueling sheds.
- ❑ Cargo handling sheds.
- ❑ Specialized handling equipment.
- ❑ Clearance.
- ❑ Utilities.

■ Identify cargo handling cranes.
- ❑ Specialized handling equipment.
- ❑ Clearance.
- ❑ Utilities.

■ Identify general cargo wharves.
- ❑ Location.
- ❑ Number.
- ❑ Linear meters.

■ Identify bulk cargo wharves.
- ❑ Type.
- ❑ Location.
- ❑ Use.
- ❑ Numbers.
- ❑ Linear meters.

■ Identify supplementary wharves.
- ❑ Type.
- ❑ Location.
- ❑ Normal use.
- ❑ Number.
- ❑ Linear meters.

■ Identify offshore pipeline berths.
- ❑ Location.
- ❑ Number.

■ Identify mooring and berth facilities.
- ❑ Maximum safe draft.
- ❑ Hard and unimproved sites usable for cargo.
- ❑ Identification.
- ❑ Location.
- ❑ Length.
- ❑ Width.
- ❑ Surface composition.

■ Identify stevedore gear (gear used for unloading and loading cargo).
- ❑ Type.
- ❑ Location.
- ❑ Quantity.
- ❑ Condition.

■ Identify cranes.
- ❑ Type.
- ❑ Locations.
- ❑ Number.
- ❑ Normal use.
- ❑ Owner.
- ❑ Motive power.
- ❑ Size.

■ Identify storage facilities.
- ❑ General cargo storage.
- ❑ Individual covered storage structures.
- ❑ Refrigerated structure.
- ❑ Open storage areas.
- ❑ Individual open storage areas.
- ❑ Bulk cargo storage.
- ❑ Dry products storage.
- ❑ Coal storage.
- ❑ Petroleum products storage.

■ Provide miscellaneous information.
- ❑ Clearance facilities.
- ❑ Railroads.
- ❑ Roads.
- ❑ Inland waterways.
- ❑ Pipelines.

Ship Building and Repair Facilities

■ Identify ship building and repair facilities.
- ❑ Location.
- ❑ Capabilities.
- ❑ Category.

■ Identify dry-docks.
- ❑ Location.
- ❑ Type.
- ❑ Condition.
- ❑ Type of dock.
- ❑ Crane service.
- ❑ Power required.

■ Identify floating dry-docks.
- ❑ Location.
- ❑ Dimensions.
- ❑ Crane service.
- ❑ Owner.

■ Identify ship building ways.
- ❑ Location.
- ❑ Type.
- ❑ Condition.
- ❑ Length.
- ❑ Width.

■ Identify machine shops.
- ❑ Location.
- ❑ Capacity.
- ❑ Normal activity.
- ❑ Owner.

■ Identify foundries.
- ❑ Location.
- ❑ Capacity.
- ❑ Normal activity.
- ❑ Condition.
- ❑ Owner.

Other Considerations

■ Assess any improvements planned or underway.

■ Identify the port's defenses.

■ Identify the protective works of the harbor.
- ❑ Type.
- ❑ Location.
- ❑ Alignment.

Table 1-6. Example information requirements for transportation infrastructure (continued)

❑ Dimensions. ❑ Construction design. ■ Identify the fire protection. ❑ Fire boats (type, power, location, number, pumping capacity, condition). ❑ Shore fire-fighting equipment (location, type, number, condition). ❑ Water supply (source, adequacy, distribution system). ■ Evaluate harbor security. ■ Evaluate harbor maintenance. ❑ Routine maintenance. ❑ Equipment available. ❑ Dredging requirements. ❑ Rehabilitation requirements. ■ Evaluate the port's utilities. ❑ Water supply. - Location. - Potability. - Distribution. - Capacity. - Adequacy. - Storage (location, type, capacity).	❑ Electricity source. - Location. - Current characteristics. - Substations. ❑ Source of fuel. - Type. - Storage. ■ Evaluate the port's support facilities. ❑ Communication facilities. ❑ Military transportation facilities. ❑ Marine railroads. - Location. - Owner. - Type. - Track length. - Gauge. - Hauling capacity. - Power system. ❑ Handling equipment (general condition). ❑ Ordnance facilities.

COMMUNICATIONS

1-95. Communication facilities in modern cities are expansive and highly developed. Complicated networks of landlines, radio relay stations, fiber optics, cellular service, and the Internet provide a vast web of communication capabilities. This communication redundancy allows for the constant flow of information.

1-96. National and local engineers and architects may have developed a communication infrastructure more effective and robust than it might first appear. Additionally, the use of cellular phones, computer networking, and fiber-optic cable may significantly supplement or even replace the need for using FM/UHF radios.

1-97. Developing countries may have little in the way of communication infrastructure. Information flow can depend on less sophisticated means—couriers, graffiti, rumors/gossiping and local printed media. Even in countries with little communication infrastructure, radios, cell phones, and satellite communications may be readily available to pass information. Understanding communication infrastructure of a city is important because it ultimately controls the flow of information to the population and the enemy. (See table 1-7.)

Table 1-7. Example information requirements for communications infrastructure

Communications

■ Determine the status of the communication facilities.
- ❑ Location.
- ❑ Type (radio, television).
- ❑ Primary use.
- ❑ Importance.
- ❑ Controlling authority.
  - Agency involved.
  - Function.
  - Location.
  - Relationship to military.

■ Evaluate each facility's layout.
- ❑ Transmitting receiving equipment.
  - Location.
  - Type.
  - Frequency range.
- ❑ Control buildings.
  - Location.
  - Power source.
  - Type.
  - Voltage.
  - Transformer requirement.
- ❑ Auxiliary power source.
  - Type.
  - Voltage.
  - Duration of usage.
- ❑ Antenna fields.
  - Location.
  - Dimensions.
  - Feed systems.
  - Use.
  - Polarization.
  - Mounting structure.
  - Radiation pattern.
  - Support areas.
- ❑ Radio relay stations (location).
- ❑ Repair center.
  - Location.
  - Status.
  - Number and proficiency of technicians.
  - Technical details.
- ❑ Equipment identification.
  - Frequency range.
  - Poles (materials, treatment, spacing, number of cross-arms).
  - Underground and underwater cables (method, type, location).
  - Submarine cable facilities (if any).
  - Cable (type, location, description).
  - Terminal and operation equipment (type, dimension, power requirements, technical characteristics, land line connections).
- ❑ Regional computer networks.
  - Types of computers and locations.
  - Types of networks and control centers.
- ❑ Operator requirements.
- ❑ Operator status.
- ❑ Maximum reliable range.
- ❑ Power source requirements.
- ❑ Transmitter specifications.
- ❑ Receiver specifications.
- ❑ Antennae.
- ❑ Schematics or blueprints of the facility.
- ❑ Connectivity to regional/national communication networks.

■ Examine the region's entire communications network.
- ❑ Military communications establishment.
  - Background.
  - Staff control.
  - Type.
  - Other facilities under military.
  - Source.
  - Key personnel.
  - Training.
  - Equipment.
  - Production facilities.
- ❑ Research and development centers.
  - Installation.
  - Projects (type, location, purpose).
  - Performance.
  - Progress.
  - Foreign contributions.
- ❑ Intercept and direction finding stations.
  - Location.
  - Line of communication.
  - Type of shelter.
  - Antenna layout.
  - Rotating antenna (type, number, description, pattern).
- ❑ Telephone and telegraph facilities.
  - Line routes.
  - Construction.
  - Exchanges and offices.
  - Repair facilities.
  - Interconnection of system.
  - Construction line.
  - Open wire line (material, spacing, treatment, conductor).
- ❑ Cellular phones.
  - Cellular tower locations.
  - Cellular tower coverage.

Table 1-7. Example information requirements for communications infrastructure (continued)

❑ Print media. - Newspapers, periodicals, and pamphlets. - Billboards. - Postal facilities. ❑ Police, fire, and rescue communications systems. ❑ Emergency Broadcast Systems. ❑ Low-technology media (car horns, drums, graffiti, burning tires). ❑ Local and regional television coverage. - Number of channels. - Station locations.	❑ Satellite earth stations (locations). ❑ Electromagnetic (EM) activity that could hamper friendly communications. ❑ High voltage/EM radiation hazard areas. ■ Determine key media organizations and reports. ❑ Local. ❑ International. ❑ US. ■ Determine the data transmission capability through satellite communications.

ENERGY

1-98. All societies require energy (such as wood, coal, oil, natural gas, nuclear, and solar) for basic heating, cooking, and electricity. Energy is needed for industrial production and is therefore vital to the economy. In fact, every sector of a city's infrastructure relies on energy to some degree. Violence may result from energy scarcity. From a tactical and operational perspective, protecting an urban area's energy supplies prevents unnecessary hardship to the civilian population and, therefore, facilitates mission accomplishment. Power plants, refineries, and pipelines that provide energy resources for the urban area may not be located within the urban area. Energy facilities are potential targets in an urban conflict. Combatant forces may target these facilities to erode support for the local authorities or to deny these facilities to their enemies.

1-99. Electricity is vital to city populations. Electric companies provide a basic service that provides heat, power, and lighting. Because electricity cannot be stored in any sizable amount, damage to any portion of this utility will immediately affect the population. Electrical services are not always available or reliable in the developing world.

1-100. Interruptions in service are common occurrences in many cities due to a variety of factors. Decayed infrastructure, sabotage, riots, military operations, and other forms of conflict can disrupt electrical service. As a critical node of the overall city service sector, the electrical facilities are potential targets in an urban conflict. Enemy forces may target these facilities to erode support for the local authorities or friendly forces. (See table 1-8.)

Table 1-8. Example intelligence requirements for energy infrastructure

General Information

- Describe the type of power sources.
  - Natural gas.
  - Nuclear.
  - Coal.
  - Hydroelectrical.
  - Geothermal.
  - Oil.
  - Solar.
- Assess the significance of the power source.
  - Economic.
  - Social.
  - Military.
- Determine the effect on the urban population should power source availability be disrupted.

Power Plant Layout

- Determine the fuel source.
  - Type.
  - Location.
  - Available reserve.
  - Usage rate.
- Determine who owns and operates the power plant.
- Identify the generators.
  - Location.
  - Quantity.
  - Output.
- Identify the turbines.
  - Location.
  - Quantity.
- Identify the exciters.
  - Location.
  - Quantity.
  - Locate the boiler (steam plant).
- Locate the compressor (gas power plant).
- Locate the combustion chamber (gas power plant).
- Locate the diesel engine (diesel power plant).
- Locate the reactor containment structures (nuclear power plant).
- Locate water intakes and outlets (nuclear and coal power plants).
- Locate power transformers.
- Locate switch yards.
- Locate the power grid that services the power plant.
- Identify the power generation system.
- Identify the power distribution system.
- Identify the times street lights are turned on and off.
- Locate the power plant step-down transformers used for power distribution.
- Identify the control rooms.
- Identify the condensers.
- Identify the water pumps.
- Locate the power generator backup (if any).
- Locate the substation.
- Evaluate how substations are powered.
- Locate the water storage center.
- Identify the fuel storage centers.
  - Location.
  - Size.
  - Capacity
  - Fuel type.
  - Usage rate.
- Determine which station or substation is the primary power plant for the urban area.
- Determine the best component to disable the facility and how long it would be disabled.
- Determine whether the power plant controls interconnected energy.
- Evaluate plant security measures.
  - Military/civilian personnel.
  - Fencing and/or other physical security obstruction.
  - Surveillance devices/mechanisms.
- Evaluate the threat to the surrounding area should this facility be damaged.
  - Inhabitants.
  - Animal life.
  - Surrounding ecosystem.
- Petroleum and Natural Gas Facilities.

Petroleum and Natural Gas Facilities

- Identify the facility location.
- Identify the facility type.
- Identify the facility product.
- Identify the size of the facility.
- Identify the owner.
- Describe the status of the facility.
- Assess the general condition of the facility.
- Identify the date the facility was constructed.
- Determine the effect that the disruption of the facility's operation would have on the urban area and urban population.
- Determine the easiest method for rendering the facility inoperable.
  - Method.
  - Length of time inoperable.
- Identify the facility specifications.
  - Level of production.
    - Barrels.
    - Tons.
    - Cubic feet.
  - Percentage of national production.
  - Percentage of national refining/cracking.
  - Percentage of infield processing.
  - Percentage of refinery processing.

Table 1-8. Example intelligence requirements for energy infrastructure (continued)

- ■ Examine the facility layout.
  - ❑ Producing wells.
  - ❑ Reserves.
    - Proven.
    - Unproven.
    - Location.
  - ❑ Processing plants.
  - ❑ Refinery processing area.
  - ❑ Atmospheric distillation towers.
  - ❑ Crude oil feed furnaces.
    - Type.
    - Location.
    - Number feeding towers.
  - ❑ Receiving facilities and crude oil storage.
  - ❑ Catalyst vessels.
    - Type.
    - Location.
    - Function.
  - ❑ Nearest refinery (distance).
  - ❑ Transportation.
    - Method.
    - Identification.
    - Destination.
  - ❑ Vapor vessels.
    - Type.
    - Function.
    - Location.
  - ❑ Plant utilities.
    - Water.
    - Power.
  - ❑ Finished product storage areas.
    - Type.
    - Location.
    - Function.
  - ❑ Administration and maintenance facilities.
  - ❑ Critical vulnerabilities.
  - ❑ Obtain facility blueprints or sketch diagrams.
- ■ Examine the fuel storage areas.
  - ❑ Type.
  - ❑ Ownership.
  - ❑ Storage tanks.
    - Location.
    - Displacement (above/below ground).
    - Shape.
  - ❑ Transportation.
    - Type.
    - Number
    - Characteristics.
  - ❑ Receiving and distribution facilities.
  - ❑ Support facilities.
  - ❑ Best method for rendering storage facility inoperable.
- ■ Identify any planned expansion at the plant.
  - ❑ Expected increase.
  - ❑ Date.
  - ❑ Method.

WATER AND WASTE DISPOSAL

1-101. Water is an essential resource. As populations grow, demand for potable water increases. In some areas of the world, the supply of fresh water is inadequate to meet these demands. By 2025, between 2.7 and 3.5 billion people may live in water-deficient countries. In developed nations, water companies provide the population with clean water. In much of the developing world, no formal water authorities exist. Sewage, industrial waste, and pollution pose threats to the water supply.

1-102. Deliberate acts of poisoning cannot be overlooked where access to the water supply is not controlled. US forces may gain no marked tactical advantage by controlling this system, but its protection minimizes the population's hardship and thus contributes to overall mission success. A buildup of garbage on city streets poses many hazards to include health threats and obstacles. Maintenance or restoration of urban garbage removal to landfills can minimize this threat and improve the confidence of the civilian population in the US friendly mission. (See table 1-9.)

Table 1-9. Example information requirements for water and waste disposal infrastructure

Utilities ***Water Systems*** ■ Identify the water control center. ❑ Size/output. ❑ Method of purification. ❑ Grid/pipe layout. ■ Identify substations. ❑ Pumping stations. ❑ Water filtration plant. ❑ Water supply towers. ❑ Wells. ■ Evaluate the water quality of local streams, rivers, lakes, and oceans (health risks of contact with untreated water). ■ Determine the effectiveness of local leak detection. ■ Determine whether the urban area is experiencing water shortage. ■ Evaluate the local irrigation system and practices. ■ Determine reliability of the engineering and environmental testing. ■ Determine whether water treatment is privatized. ■ Identify the types of pipes installed. ■ Determine the types of security present at the facility. ■ Identify rivers/canals that run through the city.	❑ Location. ❑ Depth. ❑ Width. ❑ Tide. ❑ Current. ❑ Seasonal changes (time frozen, flooded, dried out). ❑ Dams. ***Sewage and Waste Disposal*** ■ Determine the adequacy of the sewage and waste disposal system. ❑ Collection. ❑ Transport. ❑ Incinerators. ❑ Dumps/landfills. ❑ Toxic waste. ❑ Medical waste. ■ Identify actions that would lead to the breakdown of the waste disposal system. ■ Identify those in charge of waste and sewage management. ■ Locate the control center of the sewage system. ■ Determine procedures for the facility. ■ Determine the schedule of operation. ■ Evaluate the facility's security.

RESOURCES AND MATERIAL PRODUCTION

1-103. Understanding the origination and storage sites of resources that maintain an urban population can be especially critical in stability operations and civil support operations. These sites may need to be secured against looting or attack by threat forces in order to maintain urban services and thereby retain or regain the confidence of the local population in the US mission. Additionally, military production sites may need to be secured to prevent the population from gaining uncontrolled access to quantities of military equipment. (See table 1-10.)

Table 1-10. Example information requirements for resources and material production infrastructure

Resources and Material Production ■ Identify the urban area's resources. ❑ Natural. ❑ Manmade. ■ Evaluate the available fuel resources. ❑ Storage. ❑ Transportation. ❑ Emergency supply. ❑ Access. ❑ Distribution. ❑ Production. ❑ Type(s). ■ Evaluate the region's mineral resources. ❑ Types. ❑ Use. ❑ Storage. ❑ Extraction. ■ Locate active mining operations. ❑ Hard. ❑ Liquid. ■ Identify materials being mined. ■ Determine the primary application of these products. ❑ Commercial. ❑ Private. ❑ Public. ❑ Military. ■ Locate the manufacturer's resource centers. ❑ Location. ❑ Types. ❑ Transportation routes in and out. ❑ Types of transportation. ■ Locate the material-producing factories. ❑ Location. ❑ Material produced. ❑ Size of factory. ❑ Number of employees. ❑ Sector of production. ■ Identify any materials produced for military purpose. ❑ Type. ❑ Purpose. ❑ Location of military production. ❑ Local use or export. ■ Identify specific strengths/weaknesses of the materials and products due to local production methods. ■ Identify the main supply of materials.

FOOD DISTRIBUTION

1-104. A basic humanitarian need of the local populace is food. During periods of conflict, food supplies in urban areas often become scarce. Maintaining and restoring normal food distribution channels in urban areas will help prevent a humanitarian disaster and greatly assist in maintaining or regaining the good will of the local population for US forces. It may be impossible to immediately restore food distribution channels following a conflict, and US forces may have to work with NGOs that specialize in providing these types of services. This may require friendly forces to provide protection for NGO convoys and personnel in areas where conflict may occur. (See table 1-11.)

Table 1-11. Example information requirements for food distribution infrastructure

Food Distribution ■ Evaluate food production and distribution. ❑ Distribution point locations (routes normally taken to and from distribution points). ❑ Production center locations. ❑ Ability to feed population. ❑ Extent of the urban area's reliance on outside food sources. ❑ Schedule of distribution. ❑ Where is the food warehouse/stored prior to distribution? ■ Who is controlling distribution of food? ❑ Are there groups or individuals getting preferential treatment? ❑ Are there groups or individuals that are not receiving food distributions? ■ Determine the involvement of NGOs in food distribution. ❑ Organization. ❑ Number of personnel. ❑ Type of support.

MEDICAL FACILITIES

1-105. While the health services infrastructure of most developed cities is advanced, medical facilities are deficient in many countries. International humanitarian organizations may represent the only viable medical care available. The rudimentary care provided in most developing world cities is not up to Western standards. Compounding this problem is the presence of deadly parasites and diseases. Human Immunodeficiency Virus (HIV) is devastating many of the urban centers in the developing world and therefore the local blood supply must be looked upon with great suspicion. Infectious disease, famine, and natural disasters can overwhelm a city's medical infrastructure and create immense suffering. Offering support to an existing medical system may augment the US mission, as well as foster its legitimacy. (See table 1-12.)

Table 1-12. Example information requirements for medical infrastructure

Medical Facilities ■ Identify medical facilities. ❑ Location. ❑ Staff. - Doctor-to-patient ratio. - Support personnel. - Number of staff members who speak English. - Number of staff members who are Western educated. - Hospital managers. ❑ Number of patients. ❑ Number of beds. ❑ Number of surgical operating rooms. ❑ Number of intensive care rooms. ❑ Quality of the medical care provided. ❑ Quality and quantity of medical supplies.	❑ Availability of private medical facilities. ❑ Quality and quantity of local blood supply. - Location of blood banks. - Amount of blood stored. - Blood screening process and its ability to adequately screens for infectious diseases. ❑ Environmental health risk. - Predicted infectious disease risk and occurrence. - Acquired immune deficiency syndrome (AIDS) risk. ❑ Availability of medical capable transport from the host nation. ❑ Local mortuary facilities. - Morgues. - Cemeteries.

LOCAL POLICE, MILITARY UNITS WITH POLICE AUTHORITY OR MISSIONS, AND FIREFIGHTING UNITS

1-106. These elements can be critical in maintaining public order. Their operations must be integrated with friendly forces in friendly forces controlled areas to ensure that stability and security are restored or maintained. As discussed in Chapter 3, the precinct structure of these organizations can also provide a good model for the delineation of unit boundaries with the urban area. It may be necessary for friendly forces to provide training for these elements. (See table 1-13.)

Table 1-13. Example of information requirements for law enforcement and firefighting instructions

Police or Military Units with Police Authority/Mission ■ Describe police or military units with police authority/mission. ❑ Station locations. ❑ Substation locations. ❑ Headquarters location. ❑ Organizational structure. ❑ Key leaders. ❑ Operating borders. ❑ Jurisdiction borders. ❑ Number of police (active and reserve). ❑ Number of administrative personnel. ❑ Types of units (uniformed, plainclothes, special). ❑ Weapons and equipment. ❑ Communications equipment, procedures, and frequencies or telephone numbers. ❑ Training. ❑ Proficiency. ❑ Capabilities.	❑ Limitations ❑ Level of corruption. ***Firefighting Units*** ■ Describe the fire fighting units. ❑ Station locations. ❑ Substation locations. ❑ Operating borders and areas. ❑ Number of firefighters (active and reserve). ❑ Full-time or volunteer. ❑ Number and types of vehicles (pumper, ladder, other). ❑ Other fire fighting equipment. ❑ Location and condition of fire hydrants. ❑ Communications equipment, procedures, and frequencies or telephone numbers. ❑ Training. ❑ Proficiency. ❑ Capabilities. ❑ Limitations. ❑ Firefighting units outside urban area that assist in city emergencies.

CRISIS MANAGEMENT AND CIVIL DEFENSE

1-107. Local crisis management procedures and civil defense structures can aid US forces in helping to care for noncombatants in areas of ongoing or recent military operations. Additionally, the crisis management and civil defense leadership will often be local officials that may be able to provide structure to help restore or maintain security and local services in urban areas under friendly control. Many larger urban areas have significant response teams and assets to deal with crises. The loss of these key urban "maintainers" may severely impact not only military operations within the urban environment but also threaten the health or mobility of those living there. During periods of combat this may also affect the ability of Soldiers to fight as fires or chemical spills remain unchecked or sewer systems back up. This is especially true when automatic pumping stations that normally handle rising water levels are deprived of power. It may be necessary for friendly forces to provide training for these elements. (See table 1-14.)

Table 1-14. Example information requirements for crisis management and civil defense infrastructure

Crisis Management Procedures	*Civil Defense Structure*
■ Describe crisis management procedures within the urban area. ❑ Decision makers. ❑ Status of the civil alert system. - Procedures. - Effectiveness. - Results of previous alerts/tests. ❑ Existence and details of the civil evacuation plan. - Procedures. - Effectiveness. - Results of previous evacuations/tests.	❑ Describe the civil defense structure. ❑ Civil defense plans. ❑ Organization of the civil defense agency (key personnel). ❑ Location of the facilities available for civil defense. - Key industry sites. - Underground shelters. - Food storage sites. - Potable water sites. - Medical supplies. - Hospitals. ❑ Warning and alert procedure. ❑ Evacuation routes and capacities.

SUBTERRANEAN FEATURES

1-108. Subterranean features can be extremely important in identifying underground military structures, concealed AAs, and maintaining public services. (See table 1-15.)

Table 1-15. Example information requirements for subterranean infrastructure

Subterranean Features ■ Locate other subterranean features. ■ Describe the type of feature. ❑ Maintenance access tunnel. ❑ Electric grid/utility line. ❑ Pedestrian passageway. ❑ Sewer drainage systems and waterways. ❑ Natural underground passageway. ■ Evaluate the characteristics of the feature. ❑ Shape. ❑ Dimensions. ❑ Rise of arch. ■ Assess the significance of the feature. ❑ Connections to the tunnel/passage. ❑ Result if use of the route is denied. ❑ Alternate routes. ■ Describe the adjacent terrain. ■ Examine the surface features over the tunnel. ■ Examine the surface features over the tunnel. **Subterranean Layout** ■ Identify the alignment. ❑ Horizontal (position, curve, radius, curve location). ❑ Vertical (grade percent, length, location). ■ Identify passageways. ❑ Dimension. ❑ Spacing.	■ Identify choke points (manmade and natural). ❑ Location. ❑ Dimension. ■ Describe the sewer/drainage system. ❑ Location. ❑ Power source. ❑ Cross section. ❑ Sides. ❑ Bottom. ❑ Normal depth. ❑ Normal current velocity. ■ Identify the ventilation system. ❑ Description. ❑ Adequacy. ■ Describe the lighting facilities. ❑ Type. ❑ Location ❑ Power source. ■ Locate traffic control markings. **Subterranean Construction** ■ Locate the horizontal and vertical constructions. ❑ Type. ❑ Minimum clearance. ❑ Location from portal. ■ Evaluate the shoring and bracing. ❑ Spacing location. ❑ Design.

Table 1-15. Example information requirements for subterranean infrastructure (continued)

❑ Materials. ❑ Dimensions. ❑ Arrangements. ■ Assess the overburden. ❑ Material. ❑ Depth. ■ Evaluate the features of the lining materials. ❑ Type. ❑ Thickness. ❑ Condition. ❑ Point of change ■ Identify the year of construction. ■ Evaluate the effects of climate and weather on the structure. ■ Provide pertinent geological data. ■ Determine the structure's susceptibilities to above-ground demolitions. ■ Identify buildings in the urban area that have basements and subterranean spaces. ❑ Residential. ❑ Government. ❑ Military. ❑ Commercial. ❑ Industrial.	❑ Materials. ❑ Dimensions. ❑ Arrangements. ■ Assess the overburden. ❑ Material. ❑ Depth. ■ Evaluate the features of the lining materials. ❑ Type. ❑ Thickness. ❑ Condition. ❑ Point of change. ■ Identify the year of construction. ■ Evaluate the effects of climate and weather on the structure. ■ Provide pertinent geological data. ■ Determine the structure's susceptibilities to above-ground demolitions. ■ Identify buildings in the urban area that have basements and subterranean spaces. ❑ Residential. ❑ Government. ❑ Military. ❑ Commercial. ❑ Industrial.

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Chapter 2
The Threat in the Urban Environment

2-1. The obligation of intelligence professionals includes providing adequate information to enable leaders to distinguish threats from non-threats and combatants from noncombatants. This legal requirement of distinction is the initial obligation of decision makers who rely primarily on the intelligence they are provided.

2-2. Threats in the urban environment can be difficult to identify due to the often complex nature of the forces and the environment. In urban terrain, friendly forces will encounter a variety of potential threats such as conventional military forces, paramilitary forces, insurgents/guerillas, terrorists, common criminals, drug traffickers, warlords, and street gangs. These threats may operate independently or some may operate together. Individuals may be active members of one or more groups. Many urban threats lack uniforms or obvious logistical trains and use networks versus hierarchical structures.

2-3. Little information may be available concerning threat TTP so intelligence staffs must collect against these TTP and build threat models. The enemy situation is often extremely fluid—locals friendly to us today may be tomorrow's belligerents. Adversaries seek to blend in with the local population to avoid being captured or killed. Enemy forces who are familiar with the city layout have an inherently superior awareness of the current situation. Finally, US forces often fail to understand the motives of the urban threat due to difficulties of building cultural awareness and situational understanding for a complex environment and operation. Intelligence personnel must assist the commander in correctly identifying enemy actions so that US forces can focus on the enemy and seize the initiative while maintaining an understanding of the overall situation.

2-4. Potential urban enemies share some characteristics. The broken and compartmented terrain is best suited to the use of small unit operations. Typical urban fighters are organized in squad size elements and employ guerrilla tactics, terrorist tactics, or a combination of the two. They normally choose to attack (often using ambushes) on terrain which canalizes US forces and limits our ability to maneuver or mass while allowing the threat forces to inflict casualties on US forces and then withdraw. Small arms, sniper rifles, rocket-propelled grenades, mines, IEDs, "Molotov cocktails," and booby traps are often the preferred weapons. These weapons range from high tech to low tech and may be 30 to 40 years old or built from hardware supplies, but at close range in the urban environment many of their limitations can be negated.

2-5. Urban threats may attempt to acquire more dangerous weapons such as chemical weapons, biological weapons, thermobaric weapons, and possibly even nuclear weapons. Should a proliferation of weapons of mass destruction (WMD) occur, the dangers of urban combat greatly increase.

CONVENTIONAL MILITARY AND PARAMILITARY FORCES

2-6. These threats are the most overt to US and coalition forces. Identifying the capabilities and intent of these threat forces is standard for intelligence professionals for any type of operation in any type of environment. In the urban environment, however, more attention must be paid to threat capabilities that support operations in the urban environment and understanding of what, if any, specialized training these forces have received in conducting urban warfare. (See table 2-1.)

Table 2-1. Example information requirements for conventional military and paramilitary forces

Conventional Military

- ■ Identify the military orders of battle (OBs).
  - ❑ Ground.
  - ❑ Air.
  - ❑ Naval.
  - ❑ Electronic.
  - ❑ Defensive missile.
- ■ Assess the enemy experience in an urban environment.
  - ❑ Experiences in urban combat.
  - ❑ Last conflict.
  - ❑ Previous conflict.
  - ❑ Urban training.
    - Amount.
    - Quality.
    - Facilities.
  - ❑ TTP.
- ■ Determine the enemy's COG and critical vulnerability in urban warfare.
- ■ Evaluate enemy sniper capability.
  - ❑ Training.
  - ❑ Weapons.
  - ❑ TTP of employment.
  - ❑ Likely sniper sites.
- ■ Identify enemy mechanized assets and intended employment.
- ■ Determine how the enemy will fight in the urban area.
  - ❑ Attack/defend.
  - ❑ Types of weapons.
  - ❑ Tactics.
  - ❑ Enemy reinforcement plan.
  - ❑ Force size the enemy would employ in an urban environment.
- ■ Determine the relationship between the enemy and the local populace.
  - ❑ Would the local populace cooperate?
    - All segments of the populace.
    - Level of cooperation.
  - ❑ How the population will be employed?
    - Intelligence collectors.
    - Logistical support.
    - Political activists/demonstrators.
    - Human shields.
    - Other.
- ■ Determine how the enemy will employ crew-served weapons.
- ■ Determine how the enemy employs indirect fire support.
- ■ Determine whether the enemy employs mines and booby traps in the urban area.
  - ❑ Type.
  - ❑ Typical locations.
- ■ Identify the enemy's ROE.
  - ❑ Procedures.
  - ❑ Compliance.
  - ❑ Changes to ROE.

Paramilitary

- ■ Determine the nature of the paramilitary force.
  - ❑ Name.
  - ❑ Goals.
  - ❑ Ideology.
  - ❑ Numbers.
  - ❑ Leadership.
  - ❑ Identification features.
    - Clothing/uniforms.
    - Propaganda.
    - Slogans/songs/chants.
- ■ Determine the group's COG/critical vulnerability.
- ■ Determine if the paramilitary group is a threat to US forces/local government forces/police.
- ■ Determine how the paramilitary group operates.
  - ❑ Command and control.
    - Organization.
    - Communication equipment.
  - ❑ Types of weapons employed.
    - Firearms.
    - Explosives.
    - Incendiary.
    - Indirect fire.
    - Mechanized.
    - Mines/booby traps.
    - CBRN.
    - Other weapons technology (for example, NVDs).
  - ❑ Tactics.
  - ❑ Primary targets.
    - Location.
    - Type.
  - ❑ Logistical support structure.
    - Location of equipment storage facilities.
    - Transportation.
- ■ Locate the organization's headquarters.
- ■ Identify allied forces/support groups.
  - ❑ International.
  - ❑ Local security forces.
  - ❑ Other paramilitary groups.
  - ❑ Other factions.
- ■ Describe training.
  - ❑ Type.
  - ❑ Duration.
  - ❑ Quality.
  - ❑ Training facilities.
    - Location.
    - Type.
- ■ Describe the group's experiences in urban warfare.

INSURGENTS OR GUERRILLAS

2-7. When conducting insurgency or guerrilla operations, the threat will normally conform to six considerations: security, legitimacy, objective, perseverance, unity of effort, and restraint (FM 3-05.102, FM 3-07, and JP 3-0). (See table 2-2.) Under the conditions of insurgency within the urban environment, the analyst must place more emphasis on—

- Developing population status overlays showing potential hostile neighborhoods.
- Developing an understanding of "how" the insurgent or guerrilla organization operates and is organized with a focus toward potential strengths and weaknesses.
- Determining primary operating or staging areas.
- Determining mobility corridors and escape routes.
- Determining most likely targets.
- Determining where the threat's logistical facilities are located and how their support organizations operate.
- Determining the level of popular support (active and passive).
- Determining the recruiting, command and control, reconnaissance and surveillance, logistics (to include money), and operations techniques and methods of the insurgent or guerrilla organization.
- Locating neutrals and those actively opposing these organizations.
- Using pattern analysis and other tools to establish links between the insurgent or guerilla organization and other organizations (to include family links).
- Determining the underlying social, political, and economic issues that caused the insurgency in the first place and which are continuing to cause the members of the organization as well as elements of the population to support it.

Table 2-2. Example information requirements for insurgent and guerrilla forces

Insurgents/Guerrillas

- ■ Assess the nature of the guerrilla force.
  - ❑ Name.
  - ❑ Goals.
  - ❑ Ideology/purpose.
  - ❑ Numbers.
  - ❑ Leadership.
  - ❑ Identification features.
    - Clothing/uniforms.
    - Propaganda.
    - Slogans/songs/chants.
    - Symbols and/or graffiti.
  - ❑ Nature of the insurgency/instability.
- ■ Determine the guerrillas' COG and critical vulnerability.
- ■ Assess the guerillas' strategy, tactics, and operational procedures.
  - ❑ Command and control.
    - Organization.
    - Operational size of units.
    - Communication equipment.
  - ❑ Specialized sub-units.
    - Intelligence.
    - Reconnaissance.
    - Logistics.
    - Recruitment.
  - ❑ Weaponry.
    - Firearms.
    - Explosives.
    - Incendiary.
    - Indirect fire.
    - Mechanized.
    - Mines/booby traps.
    - CBRN.
    - Other weapons technology (for example, NVDs).
  - ❑ Tactics.
  - ❑ Primary targets.
    - Location.
    - Type.
  - ❑ Logistical support structure (location of equipment storage facilities).
- ■ Determine the guerrilla influence on the urban population.
  - ❑ Previous or ongoing attempts to influence the urban population.
  - ❑ Probability of attempts to influence US/coalition forces.
- ■ Identify the guerrilla reserve forces (if any) (reinforcement strategy).
- ■ Assess the support network for the guerrilla forces.
  - ❑ Local.
  - ❑ National.
  - ❑ International.
- ■ Determine how the guerrillas gain support.
  - ❑ Exploitation of social and political weakness of target society.
  - ❑ Use of propagandist-combatant guerrillas.
  - ❑ Use of armed propaganda.
  - ❑ Operation in armed propaganda teams..
  - ❑ Use of cover organizations.
  - ❑ Organization of demonstrations.
- ■ Describe the guerrilla training system.
  - ❑ Type.
  - ❑ Duration.
  - ❑ Quality.
  - ❑ Training facilities.
  - ❑ Locations.

TERRORISTS

2-8. The threat of terrorism is a growing concern for the US military. The opportunities for terrorism are greater in cities due to the presence of large numbers of potential victims, the likelihood of media attention, and the presence of vulnerable infrastructure. Likewise, many terrorist cells operate in cities because they can blend with the surrounding population, find recruits to their cause, and obtain logistical support. Terrorist cells are not confined to the slum areas of the developing world. In fact, many of the intelligence collection, logistical support, and planning cells for terrorist groups exist in the cities of Western Europe and even the United States. (See table 2-3.)

2-9. Counterterrorism efforts will draw US military forces into urban areas and require coordination with local law enforcement authorities. (For a more detailed discussion on terrorist organizational structure, methods of operation, and intelligence requirements, see ST 2-91.2 and DOD O-2000.12-H.)

Table 2-3. Example information requirements for terrorist threats

Terrorists

■ Examine the background of the terrorist group.
- ❑ Leaders and prominent members.
- ❑ Goals/motivation.
  - Political.
  - Social.
  - Criminal.
  - Religious.
- ❑ Ideology.
- ❑ Arms.
- ❑ Organization.
- ❑ Training.
- ❑ Capabilities/limitations.
- ❑ Support.
- ❑ Values.
- ❑ Homeland.
- ❑ Ethnicity.

■ Identify individual terrorists.
- ❑ Biographical data.
- ❑ Physical description.
- ❑ Sex.
- ❑ Photograph.
- ❑ Psychological profile.
- ❑ Potential informants.

■ Determine the status of incarcerated group members (if any).
- ❑ Who.
- ❑ Where.
- ❑ Reasons for incarceration.
- ❑ Duration.

■ Identify the targets of the violence.
- ❑ Government.
- ❑ Civilians.
- ❑ Rival factions.
- ❑ Military.

■ Identify the command and control structure.
- ❑ Centralized/decentralized.
- ❑ Hierarchical.
- ❑ How the terrorists communicate.
  - Methods/procedures.
  - Equipment.
- ❑ Affiliation with a parent terror organization.

■ Identify the terrorist group's TTP.
- ❑ Criminal type activities.
  - Kidnapping/ransom.
  - Bombings.
  - Murder/assassination.
  - Sabotage.
- ❑ Trends/patterns.
  - Action.
  - Frequency.
  - Timing.
  - Geographic dispersion.
  - Duration.
  - Results.
- ❑ Circumstances under which the group would likely act.
- ❑ Types of weapons available to the group and what they are likely to use.
- ❑ Capability to acquire or produce WMD to include acquisition attempts.
- ❑ Employment of PSYOP.
  - Propaganda.
  - Internet web sites.
  - Intimidation tactics.
- ❑ Areas or approaches avoided by the terrorists.
- ❑ Members of the local population avoided by the terrorists.
- ❑ Safe areas or approaches.
- ❑ Areas to avoid.
- ❑ Countermeasures.
- ❑ Security measures.

■ Identify the terrorist support network.
- ❑ Local.
- ❑ National.
- ❑ International.
  - Degree of influence that a third-party government may have on the terrorist group.
  - Affiliation with US citizens or groups.
  - Ties to other terrorist organizations or networks.
- ❑ Terrorist supply network.
  - National backing.
  - Charity/NGO support.
  - Individual.
- ❑ Feasibility of and methods for cutting off or seizing these supplies.
- ❑ Feasibility of and methods for cutting off, freezing, or seizing financial ties/assets.

CRIME AND CRIMINAL ORGANIZATIONS

2-10. These organizations can threaten the successful completion of US operations both directly and indirectly. Criminals and criminal organizations may directly target US forces, stealing supplies or extorting money or contracts. Likewise, increased criminal activity can undermine the US efforts to

establish a sense of security among the local populace. Additionally, guerillas, insurgents, and terrorists may take advantage of criminal organizations in many ways ranging from using them to collect intelligence on US and coalition forces to obtaining supplies, munitions, or services or using their LOCs as logistical support channels. Terrorist organizations may even have their own separate criminal element or be inseparable from a criminal group. An enterprise such as narcoterrorism is an example of this.

2-11. Criminal activities will usually continue and may even increase during full spectrum operations in the urban environment. Criminal organizations often run black markets and illegal smuggling operations in and around urban areas. These types of activities are often established prior to the arrival of US and coalition forces and may proliferate prior to or once US and coalition forces arrive, especially if normal urban services are disrupted by the events that resulted in the US force deployment. For the local population, these activities may be the only reliable source of jobs which allow workers to provide for their families. (See table 2-4.)

Table 2-4. Example information requirements for criminal threats

Crime/Criminal Organizations

- ■ Determine the urban area's crime rate.
- ■ Identify criminal organizations in the area of operations.
  - ❑ Name.
  - ❑ Type.
  - ❑ Local/regional/international.
  - ❑ Activities.
    - Narcotics.
    - Arms dealing.
    - Prostitution.
    - Illegal immigration.
    - Illegal gambling.
    - Counterfeiting.
    - Money laundering.
    - Illegal technology transfer.
    - Other.
  - ❑ Structure and organization.
  - ❑ Weapons and equipment.
  - ❑ Other technology.
  - ❑ Communications intercept capabilities.
  - ❑ NVDs.
- ■ Determine criminal territorial divisions.
- ■ Determine the relationship between criminal organizations.
  - ❑ Financial ties.
  - ❑ Information sharing.
  - ❑ Training.
  - ❑ Operations.
- ■ Identify the degree of cooperation between government agencies and criminal organizations.
- ■ Determine the extent of illegal narcotics in the urban area.
  - ❑ Types of drugs.
  - ❑ Quantity produced within the urban area.
  - ❑ Quantity imported.
  - ❑ Traffic patterns of distribution.
- ■ Identify the organization's command and control element.
  - ❑ Headquarters.
  - ❑ Key leaders.
  - ❑ Production and distribution procedures.
  - ❑ Facility locations.
  - ❑ Shipment routes.
  - ❑ Front companies involved.
- ■ Describe any prior civilian riot activity.
  - ❑ Issue or event that sparked riots.
  - ❑ Location.
  - ❑ Level of violence.
- ■ Describe ties to legitimate businesses and/or political parties.

INFORMATION OPERATIONS

2-12. Adversary IO pose a threat to friendly forces. These threats can consist of propaganda, denial and deception (D&D), electronic warfare (EW), computer network attack (CNA), and, although not a direct threat, the use of the media to achieve an objective. In general, the purposes of these attacks are to—

- Erode domestic and international support for the mission.
- Deny friendly forces information on enemy disposition and strength.
- Disrupt or eavesdrop on friendly communications.
- Disrupt the US and coalition information flow.

2-13. Through the use of propaganda, adversaries try to undermine the US and coalition mission by eroding popular support among the local population, the American people, and/or the international community. This is accomplished through savvy public relations campaigns, dissemination of falsehoods or half-truths, staging attacks on civilian sites and then passing the blame onto allied forces, and conducting other operations that make public statements by US leaders appear to be lies and half-truths.

2-14. Urban terrain facilitates adversarial D&D. The urban population provides a natural screen in which enemy forces can hide their identities, numbers, and equipment. There are other opportunities for D&D in cities. Enemy forces can hide military equipment in culturally sensitive places—caching weapons in houses of worship or medical facilities. Threat forces can use decoys in urban terrain to cause erroneous assessments of its combat capability, strength, and disposition of assets. Decoys can be employed to absorb expensive and limited precision-guided munitions as well as cause misallocation of limited resources.

2-15. The enemy EW threat focuses on denying friendly use of the electromagnetic spectrum to disrupt communications and radar emissions. Commercially available tactical jamming equipment is proliferating throughout the world and threatens allied communication and receiving equipment. Ensuring rapid and secure communications is one of the greatest challenges of urban operations. Allied computer networks may be vulnerable to hackers.

2-16. The media can alter the course of urban operations and military operations in general. While not a direct threat, the increasing presence of media personnel during military operations can create special challenges. Media products that can be seen real time without perspective can erode US military support both internationally and domestically. Enemy forces will attempt to shape media coverage to suit their own needs. For example, by escorting media personnel to "civilian casualty sites," they attempt to sway international opinion against friendly operations. The media may also highlight errors committed by allied forces. In this age of 24-hour media coverage, even the death of a single noncombatant can negatively affect a military campaign. (See table 2-5.)

Table 2-5. Example information requirements for information operations threats

Denial and Deception (D&D)
- ■ Determine whether the adversary has a D&D strategy.
- ■ Determine what organization(s) implement D&D policy.
- ■ Determine the structure of the organization(s).
- ■ Determine the key personnel in the organization(s).
- ■ Assess the enemy's capability to perform deception operations.
  - ❑ Type (IMINT, MASINT, SIGINT, HUMINT, CI, open-source information).
  - ❑ Equipment (concealment, EW, decoys, dummy, derelict, radar-absorbing materials/ paints, visual and thermal/ radar absorbing/scattering camouflage nets, obscurants, smoke, thermal paints, live vegetation, underground facilities, electrochromic technology/ signature management materials).
  - ❑ Training (offensive and defensive)
    - If previous D&D training was noted—
      - ▪ Determine what methods were displayed during exercises.
      - ▪ Determine the organization(s) involved.
      - ▪ Determine which intelligence disciplines were targeted.
  - ❑ Doctrine (offensive and defensive).
- ■ Determine foreign advisors/involvement.
- ■ Determine probable D&D missions and targets.
- ■ Determine confirmed D&D missions and targets.
- ■ Evaluate any previous enemy deception operations.
  - ❑ Method.
  - ❑ Level of success.

Psychological Operations
- ■ Determine whether the enemy conducts PSYOP.
  - ❑ Type.
  - ❑ Methods.
  - ❑ Effect.
  - ❑ Targets.
- ■ Identify enemy PSYOP units (if any).
  - ❑ Location/designation.
  - ❑ Doctrine.
  - ❑ Training.
  - ❑ Capabilities/limitations.
- ■ Identify propaganda being disseminated.
  - ❑ Type.
  - ❑ Dissemination process.
  - ❑ Effect of the propaganda.

Computer Network Operations (CNO)
- ■ Evaluate the enemy's ability to conduct computer network attack (CNA) and cyber attacks.
  - ❑ Capabilities/limitations.
  - ❑ Training.
  - ❑ Doctrine.
- ■ Describe previous attempts by the enemy to conduct CNA.
  - ❑ Intrusion attempts.
  - ❑ Denial of service attacks.
  - ❑ Web defacements.
  - ❑ Propaganda

HEALTH ISSUES

2-17. Urban centers provide favorable conditions for the spread of debilitating or deadly diseases. Sanitation is often poor in urban areas. Local water and food may contain dangerous contaminants. During military operations in the urban environment, sewage systems, power generating plants, water treatment plants, city sanitation, and other services and utilities are vulnerable. When disabled or destroyed, the risk of disease and epidemics increases, which could lead to unrest, further disease, riots, and casualties. "In Vietnam, over two-thirds of US Army hospital admissions were for disease. In 1968, disease cost US forces some 943,809 man days—roughly the equivalent of an infantry division for 2 months." [Source: Spurgeon Neel, Medical Support of the U.S. Army-Vietnam 1965-1970, (U.S. Army Historical Series), Washington: USGPO, 1972] "Medical records of one Russian Brigade in Chechnya show that 15 percent of the brigade was down with hepatitis at one time. Dirty water was the main culprit in the transmission of hepatitis." [Source: Lester W. Grau and William A. Jorgensen, "Viral Hepatitis and the Russian War in Chechnya," Army Medical Department Journal, May-June 1997, 2-4.]

2-18. The closely fought nature of urban warfare causes greater psychological stress than any other type of combat. Russian soldiers returning from fighting in Grozny suffer from abnormally high rates of psychological disorders.

2-19. Environmental considerations are an important factor to incorporate into IPB to ensure the commander has a complete picture of the urban environment. Industrial areas may include large storage

areas of chemicals, petroleum products, fertilizers and other toxic materials. The following are some factors that should be considered:

- Hazardous material storage areas.
- Hazardous waste storage areas.
- Chemical holding tanks.
- Petroleum storage tanks.
- Sewage treatment plants.
- Cultural and historical sites.

2-20. Other types of hazards in and around urban environments are TIMs. These include such materials as aviation fuel, pesticides, ammonia, chlorine, radioactive materials, methane, and propane. Those fighting in or around structures housing these chemicals might see them splinter, burn, or explode if hit by fire, creating the "toxic corridor," a theoretical space affected by a chemical threat and one that poses severe problems on anyone there. In such situations, even if no contaminants have been released, Soldiers must still wear protective gear, further degrading capabilities.

2-21. Improperly stored hazardous materials and pollution can both affect operations and injure troops. Cities in China have levels of sulfur dioxide five to ten times the level found in major Western cities, which could adversely affect troops operating in those environments. In some parts of Poland, the land and water is so poisoned by toxic waste that ten percent of babies are born with defects. Such toxicity affects any military personnel deployed in such regions.

2-22. The typical urban environment includes potential biological or chemical hazards that fall outside the realm of WMD. Operations within confined urban spaces may see fighting in sewers and medical facilities and the subsequent health problems that exposure to contaminants may cause. There may also be deliberate actions to contaminate an enemy's food or water or infect an enemy. Today's biological threats include Ebola, Smallpox, and Anthrax.

OTHER URBAN CONCERNS

2-23. There are additional concerns regarding the conduct of military operations within the urban environment. The analyst should, to some extent, also focus on the aviation and fire hazards discussed below.

AVIATION HAZARDS

2-24. Operations in urban environments present unique and complex challenges to aviation units. The following factors can affect aviation operations in the urban environment:

- Restricted or limited LZs and PZs.
- Increased tower, antenna, and wire hazards.
- Foreign object damage to aircraft from flying debris.
- Operating in areas with high concentrations of civilians.
- Collateral damage to property.
- Night vision system operations in the vicinity of city lights.
- Degraded communications.
- Irregular and unusually strong air currents, especially when flying low in and around urban canyons. Increased risk of collateral damage to property.
- High risk to aircraft from close-range, small arms, and MANPADS fire complicated by the proximity of noncombatants.

FIRE HAZARDS

2-25. The threat of fire has always gone hand-in-hand with combat operations. Within urban areas fire is one the greatest hazards. During the structural analysis process, an assessment must be made of the fire threat that a structure poses. Special attention should be paid to the type and location of storage tanks, gas lines, and other dangerous elements as well as their proximity to other structures and threats (such as a gas station or propane plant). Decision makers must consider increased risk and impact of fire in assessing the potential collateral damage in an operation. Fire threats include—

- Isolated fires: Restricted to a single building or part of a building.
- Area fires: Consume from building-to-building to an entire block. Generally, streets will act as firebreaks and help to contain this type of fire within a single block.
- Fire storms: The most violent and dangerous fire, capable of rapidly consuming large areas by creating windstorms and intense heat. Firestorms are uncontrollable until they exhaust the available flammables.
- Explosive hazard: Present in areas containing fuel and chemicals.

Chapter 3
Information Sources in the Urban Environment

3-1. In the urban environment, every Soldier is an information collector. Soldiers conducting patrols, manning observation posts, manning checkpoints, or even convoying supplies along a main supply route serve as the commander's "eyes and ears." The challenge for the intelligence professional is to understand what types of information Soldiers performing different tasks and missions can provide to an awareness of the overall situation, how to get them to report, and how to leverage that information into situational understanding.

3-2. This chapter briefly discusses some of the types of information that Soldiers on the battlefield with different specialties can provide to the intelligence staff. It is essential to properly brief these assets so that they are aware of the intelligence requirements prior to their missions and to debrief them immediately upon completion of their missions; this is to ensure the information is still current in their minds and any timely intelligence they may provide is available for further action. Some examples of debriefing techniques are listed in Chapter 5 and FM 2-91.6. This cycle (brief-mission-debrief-intelligence/awareness of the current situation) is continuous throughout operations.

SCOUTS, SNIPERS, RECONNAISSANCE

3-3. Scouts, snipers, and other surveillance and reconnaissance assets can provide valuable information on people and places in the urban environment. Traditionally, scouts, snipers, and reconnaissance assets are often used in surveillance roles (passive collection) from a standoff position. Operations in the urban environment, especially stability operations, may require a more active role (reconnaissance) such as patrolling for some of these assets. When employed in a reconnaissance role (active collection), these assets tend to be most useful when accompanied by an interpreter who allows them to interact with people that they encounter, which allows them to better assess the situation.

3-4. Additionally, the presence of patrols in urban areas, particularly in stability operations, may directly influence what they observe. Insurgent and local nationals may change their habits or actions either consciously or subconsciously when friendly patrols are in their area.

3-5. Scouts and reconnaissance patrols can also provide grid coordinates of key locations for future use. It is often useful to have 10-digit Military Grid Reference System (MGRS) coordinates for key locations within urban areas for contingency operations. However, without a physical description of the location, a 10-digit grid can be useless when sending personnel or delivering remote weapons fire to that location. Because of the closeness of the urban environment, a physical description of the key location is essential to ensure accuracy. Additionally, the use of landmarks—preferably ones that are visible from overhead (such as road intersections)—are highly desirable in order to confirm the location.

3-6. Snipers are trained observers who can provide clear size, activity, location, unit, time, equipment (SALUTE) spot reports that may help clarify a situation. Sniper teams operate in a stealthier mode with the intent that they remain unobserved. For example, in a gathering of people, snipers can identify the probable leaders, the gender of individuals and size of the group, and any equipment they may be carrying. Additionally, specialized optics and NVDs make snipers valuable information collection in a wide range of conditions. Snipers are also trained as trackers and may be able to use those skills to give the commander valuable information on which to act immediately.

SPECIAL OPERATIONS FORCES

3-7. SOF usually enter a joint operations area prior to the deployment of conventional Army units. They may conduct covert operations or overt operations (such as foreign internal defense missions). Their ability to observe and report can provide invaluable intelligence on the current situation in the AO. SOF personnel usually live among the local nationals and must get to know and understand in great detail the culture of the local national population within their AO.

3-8. SOF liaisons, such as a special operations command and control element (SOCCE), can provide commander and intelligence staff with access to this information as well as valuable real-time intelligence. Additionally, the Special Operations Command (SOCOM) maintains a historical database of after-action reviews and lessons learned—the Special Operations Debrief and Retrieval System—for every mission that a SOF team conducts.

ENGINEERS

3-9. Engineers can provide significant amounts of information to the Intelligence staff. They support mobility, countermobility and survivability by providing maneuver and engineer commanders with information about the terrain, threat engineer activity, obstacles, and weather effects within the AO. During the planning process engineers can provide specific information on the urban environment such as information on the effects that structures within the urban area may have on the operation, bridge weight class and conditions, and information on most likely obstacle locations and composition. Engineers can assist in assessing potential collateral damage by analyzing risks of damage caused by the release of dangerous forces, power grid and water source stability, and the viability of sewage networks. Engineers provide a range of capabilities that enhance collection efforts. Each of the engineer functions may provide varying degrees of technical expertise in support of any given assigned mission and task. These capabilities are generated from and organized by both combat and general engineer units with overarching support from geospatial means.

3-10. Topographic teams can provide both standard urban IPB products and operational decision aids. They can create or assist staffs in creating such products as No-Fire Area (NFA) overlays (hospitals, churches), trafficability overlays, target packages, refugee tracking products, line-of-sight surveys, reverse line-of-sight overlays, slope overlays, and critical infrastructure overlays. Additionally, topographic teams can provide specialized maps in scales that are needed for operations in urban environments. Topographic teams can also assist in creating special enemy decision support template products in conjunction with the intelligence staff, including those that contribute to IED defeat (see FM 3-90.119). Topographic team products may be produced in either vector or digital format. Vector products can be disseminated digitally, but are much smaller than digital products. Topographic teams function as a conduit for the broader range of geospatial products that may be available to the unit from joint, DOD, and other sources.

3-11. Further information on topographic Engineer products and services can be found at the Topographic Engineering Center (TEC) website: http://www.tec.army.mil.

MEDICAL

3-12. Health issues, as described in Chapter 2, are a potential threat in the urban environment, and the commander must be advised of potential health threats that may impact operations. Outbreaks of disease may not only affect friendly and enemy personnel directly but also require US forces to provide medical support to civilians within the AO; this can potentially cause a major drain on or even require the reallocation of resources.

3-13. The Armed Forces Medical Intelligence Center (AFMIC) is responsible for producing finished intelligence on foreign military and civilian medical capabilities, infectious disease and environmental

health risks, and scientific and technical developments in biotechnology and biomedical subjects of military importance. Staffs can obtain Medical intelligence information through their intelligence channels or directly from AFMIC via their website http://mic.afmic.detrick.army.mil/. In an emergency, up-to-date medical intelligence assessments can be obtained by contacting Director, AFMIC, 1607 Porter Street, Fort Detrick, MD 21702-5004. The message address is DIRAFMIC FT DETRICK MD. Medical intelligence elements and AFMIC can provide the following reports:

- Medical Capabilities Studies.
- Disease Occurrence—Worldwide Reports.
- Foreign Medical Materiel Studies.
- Disease and Environmental Alert Report.
- Foreign Medical Facilities Handbook.
- Scientific and Threat Intelligence Studies.
- Foreign Medical Materiel Exploitation Reports.
- Quick Reaction Responses.
- AFMIC Wire.

3-14. The AFMIC 24-Hour Service/Request for Information (RFI) telephone number is commercial (301) 619-7574 or DSN 343-7574. The email address is afmicops@afmic.detrick.army.mil.

3-15. During the planning process, Medical support personnel at individual units can provide information on the nature of local health risks associated with the urban environment in which operations will take place and provide preventive measures that the unit or unit personnel may take to mitigate or avoid these risks. Medical personnel can also help coordinate a medical survey to pinpoint existing hospitals, clinics, sanitariums, blood banks, pharmaceutical industries, medical supply warehouses, and veterinary and public health facilities, as well as to identify key indigenous Medical personnel within the urban area.

3-16. During an operation, Medical personnel will monitor and report any new health risks that emerge. Intelligence on the enemy medical status is also valuable. Not only does it disclose enemy strengths and weaknesses it can also alert friendly medical units as to what diseases and conditions for which EPWs/detainees might require treatment.

3-17. Medical personnel are a prime source of intelligence provided that they are trained on how to observe and report pertinent data. Types and frequency of wounds and disease, attitudes of enemy prisoners/detainees undergoing treatment, type and utility of captured enemy medical supplies, and observations of the local populace are all important sources of information that medical personnel should provide.

3-18. Medical personnel can also be invaluable in detecting the use of chemical or biological weapons by seeing their effects on people. These agents may be more difficult to detect in urban areas specifically because of the closeness of the population, the sanitary problems associated with cities, and the general breakdown of support services and infrastructure.

AVIATION

3-19. When determining enemy capabilities and COAs, aviation units can provide intelligence personnel with information on what air operations are feasible in any given urban environment. During operations, gun camera video and surveillance systems carried by aircraft can provide timely, thorough, and on-demand information to intelligence personnel. The stand-off capability of most aircraft can allow observation of threat forces and activities from tracking individual vehicles through city streets to determining locations of enemy obstacles in the urban environment.

CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR

3-20. During the planning process, chemical corps personnel can provide estimates on the effects of CBRN use in urban environments as well as the location, types, and potential effects of TIMs. Due to the prevalence of biological hazards and TIMs in many urban areas, chemical corps personnel may be crucial in identifying CBRN hazards that Soldiers may not normally recognize as a threat. They can also assist in determining if a CBRN hazard exists as part of the urban environment or is a deliberate weaponized attack.

AIR DEFENSE ARTILLERY

3-21. Air Defense Artillery (ADA) personnel may be assigned multiple missions in the urban environment, especially when the enemy air threat is assessed as low or nonexistent. Air and Missile Defense (AMD) units can provide an awareness of the air picture either with their organic systems or indirectly through adjacent AMD units. The air picture can provide units in the urban environment with an understanding of the current threat posed by enemy UASs, cruise missiles and rockets, mortars, and missiles. ADA personnel who are deployed in the urban environment to provide air defense protection may have secondary non-AMD missions such as performing observation of named areas of interest (NAIs) or conducting urban patrols with the units into which they are integrated.

3-22. AMD systems, such as the Avenger, have acquisition systems and capabilities that can be used for other purposes. For example, the forward looking infrared (FLIR) system on the Avenger may be employed along parts of the urban perimeter to detect unusual or unauthorized traffic into or out of the urban area at night, such as insurgent or guerrilla infiltration and exfiltration or smuggling operations.

CIVIL AFFAIRS

3-23. Civil Affairs personnel will be a key asset in any operation undertaken in the urban environment. The missions of Civil Affairs personnel keep them constantly interacting with the local population. They can keep intelligence staffs apprised of local national sentiments towards US and coalition forces and policies. Civil Affairs personnel are tasked with writing local area assessments whenever they deploy to an AO. These reports focus on the local geography, political geography, history, people, labor situation, and legal system. These reports should be continuously updated as the mission in that AO continues. (Appendix A contains an example outline of a Civil Affairs assessment.) Intelligence personnel may be able to provide Civil Affairs personnel with initial information in many of the categories of the Civil Affairs assessment.

3-24. Intelligence personnel should ask their local Civil Affairs team for a copy and updates on their local area studies. The fact that Civil Affairs teams will be constantly traveling throughout the AO in order to conduct their missions make them good providers of combat information if they are properly debriefed by G-2/S-2 sections.

3-25. They can provide some insight to avoid potential problems especially in stability operations. For example, a commander may decide to support the local populace by building a local school and providing book and other learning materials. The locals may initially be grateful for the gesture, but Civil Affairs personnel working with the commander and intelligence staff may help avoid a more serious issue in the minds of the local nationals. Such an issue could arise if the US forces contract the building of the school to a non-local contractor rather than to allow a fully capable local contractor to do the job—thus negating the good will engendered by the gesture of building the school in the first place.

PSYCHOLOGICAL OPERATIONS TEAMS

3-26. Due to the nature of PSYOP, PSYOP Soldiers must have a thorough understanding of the local populace, to include cultural information, and must fully understand the effects that their operations are having on the local populace. They inform the supported commander about the psychological effects that

US military activities may have on the local national population. Intelligence personnel can leverage this information which can provide key insights into the current mood of local nationals.

3-27. PSYOP studies are prepared by the US Army 4th Psychological Operations Group, strategic studies detachments, and the National Ground Intelligence Center (NGIC). There are three types of PSYOP studies:

- The PSYOP annex to military capabilities study, which summarizes PSYOP relevant issues.
- The special PSYOP study which addresses such subjects as specific target groups, regional or geographical areas, social institutions, and media analysis. The SPS may also discuss perceptions towards the US or issues important to specific population groups.
- The special PSYOP assessment, which is a time-sensitive intelligence memorandum (usually an electronic message) providing assessments of significant crisis situations, events, or issues from a PSYOP standpoint.

3-28. Requests for any of the three PSYOP studies are made through PSYOP or SOF units or staff liaison elements supporting the joint forces commander. Some of these studies are also available from the intelligence link of the Special Operations Command Research, Analysis, and Threat Evaluation System (SOCRATES).

MILITARY POLICE

3-29. Whether they are conducting area security operations, maneuver and support operations, internment and resettlement, or law and order operations, Military Police personnel normally have a presence across large parts of the battlefield. During stability operations, they will normally maintain a liaison with local national law enforcement officials. In some cases, they may temporarily assume Customs duties, as they did at the main airport outside Panama City during Operation JUST CAUSE. Generally, Military Police are better trained in the art of observation than regular Soldiers; with their presence at critical locations on the battlefield, they can provide a wealth of battlefield information provided that they are properly briefed on current intelligence requirements.

3-30. Military Police conduct Police Intelligence Operations (PIO), which ensure that information collected during the conduct of Military Police functions is provided as input to the intelligence collection effort. PIO supports, enhances, and contributes to the commander's FP program, the common operational picture, and situational understanding.

3-31. Military Police also maintain a detainee information database which can also track detainees in stability operations and civil support operations. Information from this database can be useful to intelligence personnel, especially when constructing link diagrams and association matrixes. Military Police personnel must be synchronized with Military Intelligence personnel when determining whether or not individual detainees should be released.

EXPLOSIVE ORDNANCE DISPOSAL

3-32. Explosive Ordnance Disposal (EOD) personnel can provide valuable information to intelligence personnel on the types of munitions that threat forces may use in the urban environment as well as their effects, recommended stand-off distances, and possible methods of employment. These munitions may range from conventional land mines to all sorts of improvised explosive devices (IEDs) such as car bombs, booby-trapped artillery shells, remotely detonated homemade bombs, and suicide vests. EOD personnel can be a valuable asset during ISR planning, especially when IEDs are a significant FP issue.

TRANSPORTATION AND LOGISTICS

3-33. Transportation and logistics personnel are constantly moving personnel and supplies up and down LOCs and throughout the AO. For that reason they are valuable sources of current information. These

personnel provide information regarding the status of LOCs, civilian population movements, the impact of weather on movement and notable activity in populated areas. In order to leverage these sources for intelligence purposes, intelligence staffs must ensure that procedures are in place to brief transportation personnel on the current intelligence picture, the intelligence requirements, reporting procedures for getting critical information into the unit intelligence channels, and to ensure that transportation personnel are debriefed as soon as possible upon completing their missions.

CIVILIAN LINGUISTS AND LOCAL HIRES

3-34. While not formal intelligence sources, US-hired linguists and local hires can provide keen insights into local cultural awareness and the current sentiments of the local population and local national authorities; they can also identify key individuals or groups that are a threat to the successful completion of the US mission.

3-35. As with open-source intelligence and NGO information, for example, all information provided by these sources must be carefully evaluated and placed into context based on the reliability, credibility, and biases of the individual.

JOINT/DOD

3-36. Most US Army operations in urban environments are likely to be Joint operations. Army Intelligence staffs at all levels must make sure that they are familiar with the intelligence collection capabilities and methods of Navy, Air Force, and Marine units operating in and around their AO. Joint operations generally bring more robust Intelligence capabilities to the AO, but require significantly more coordination to ensure that resources are being used to their fullest intelligence collection capabilities across the spectrum. Intelligence reporting procedures must be established to ensure that critical intelligence is reported to the end user in a timely manner.

3-37. The Defense Intelligence Agency (DIA) produces intelligence support packages (ISPs). The product includes graphics, land satellite (LANDSAT) and LANDSAT-digital terrain evaluation data (DTED) merge imagery, maps, target line drawings, photography (when available), and multiscale electro-optical (EO) imagery. A target summary provides data on target significance, description, imagery annotations, node functions, air defenses, and critical nodal analysis. The ISP is produced in response to the theater or joint task force (JTF) target list or an RFI. The ISP supports targeting of specific military and civilian installations.

3-38. Additionally, the DIA produces contingency support studies (CSSs) and contingency support packages (CSPs). The CSS has a large format imagery product (17 by 21 inches). It supports planning for theater operations and contingency planning. Text information includes weather and climate data, oceanography and landing beaches (amphibious operations), terrain analysis, and significant facilities. An overview map and a large-scale map of the target areas are included. The CSS focuses on an urban area, military facility, or significant terrain. It includes high-resolution EO and LANDSAT imagery.

3-39. The CSP is a large format (17 by 21 inches) and a small format (8 by 13 inches) imagery product. It is produced in response to a specific crisis. The CSP is a mission-oriented product, typically supporting noncombatant evacuation operation (NEO). Imagery includes embassy, the ambassador's residence, evacuation routes, AAs, HLZs, beaches, ports, and airfields. The format is similar to that of the CSS. It includes high-resolution imagery that supports the Section 1500 Department of State Emergency Action Plan.

3-40. The DIA also produces Gridded Reference Graphics (GRGs). This large format imagery product (17 by 21 inches) provides an overview map, a small-scale imagery mosaic, and large-scale individual prints of a specific target area. GRGs are typically focused on urban areas but are also produced to cover large maneuver areas and LOCs. The GRG complements National Geospatial-Intelligence Agency (NGA)

(formerly National Imagery and Mapping Agency) city graphics (1:25,000 to 1:10,000 scales) and provides excellent detail for urban mission planning.

3-41. According to NGA GEOINT Publication 1 dated June 2004, the NGA produces a range of products which can be useful in the urban environment. These products include city graphics, urban features databases, gridded installation imagery (SECRET-level products), the geographic names database, terrain analysis products, imagery intelligence (IMINT) briefs, and annotated graphics.

3-42. One product that has proven to be very useful in recent multinational operations is the unclassified 1-millimeter resolution imagery with grid overlaid, a street names index, and an index of numbered (key) features. Classified NGA products are available through intelligence channels and NGA representatives and support teams, on the Secret Internet Protocol Router Network (SIPRNET) at www.NGA.smil.mil and through Joint Worldwide Intelligence Communications System (JWICS) at nga.ic.gov. Classified image product libraries can be accessed through the SIPRNET and JWICS terminals. Unclassified NGA products are available through the unit supply system, topographic teams, and NGA representatives and support teams. Some products, such as the geographic names database (on the GEOnet Names Server) are available through the NGA website (www.nima.mil). For assistance with download issues from NGA websites, call the Customer Help Desk at 1-800-455-0899.

3-43. A NEO intelligence support handbook (NISH) is prepared by the unified commands to support NEO and hostage recovery operations planning. One is available for every American Embassy. These documents are classified SECRET. Contents include small format imagery (8 by 11 inches) and a text product. The NISH includes overhead imagery of ports, airfields, HLZs, potential evacuation routes, and beaches as well as photography and diagrams of pertinent US government facilities in the country.

3-44. Intelligence personnel must consider the currency of this information during planning.

MULTINATIONAL

3-45. Due to classification issues, sharing intelligence during multinational operations can be challenging. It may be the case that US forces are working in a coalition-type force which contains both member countries with whom the US has close intelligence ties and others with whom the US has few or no intelligence ties. In many cases intelligence personnel from other countries have unique skills that can significantly contribute to the friendly intelligence effort.

3-46. Establishing methods of exchanging battlefield information and critical intelligence as well as coordinating intelligence collection efforts can be crucial to the overall success of the mission. Reports from coalition members will fill intelligence gaps for the US forces and the coalition as a whole.

3-47. The unique perspective of some of the coalition forces may provide US intelligence analysts with key insights. (For example, during the Vietnam War, Korean forces used to living in environments similar to Vietnamese villages often noticed anomalies that Americans missed such as too much rice cooking in the pots for the number of people visible in the village.) Likewise, few countries have the sophisticated intelligence collection assets available to US forces, and information that the US may provide could be critical both to their mission success and to their FP.

INTERNATIONAL AND INTERGOVERNMENTAL ORGANIZATIONS

3-48. International organizations (not NGOs) and intergovernmental organizations (IGOs) will often have a presence in areas in which US forces may conduct operations, especially if those areas experience some type of unrest or upheaval prior to US operations. International organizations and IGOs include such agencies as the International Criminal Police Organization (INTERPOL), the United Nations, and the North Atlantic Treaty Organization (NATO). When providing support or considering offering support to the local populace, international organizations and IGOs usually conduct assessments of the local areas that

focus on understanding the needs of the local populace, the ability of the infrastructure to enable their support or aid to be effectively provided, and the general security situation and stability of the area.

3-49. Understandably, urban areas will be a primary focus of these reports since they are the central locations through which international and intergovernmental support will flow into an area. Copies of these reports may be available upon request.

3-50. During US operations in an urban environment, international organizations and IGOs may continue to maintain a presence. If they are willing to continue to provide copies of their assessments, their third-party view of the situation may provide intelligence analysts with valuable insights. This information of sharing—in both directions—could be integral for the success and/or legitimacy of friendly operations.

NON-GOVERNMENTAL ORGANIZATIONS

3-51. As with international organizations and IGOs, NGOs will often have a presence in areas in which US forces may conduct operations. Since most of these organizations are concerned with providing support to the local populace, their presence tends to be especially prominent in areas experiencing or that recently experienced some type of unrest or upheaval prior to US operations, during US operations, or following US operations. These organizations include such agencies as the International Committee of the Red Cross, Médecins Sans Frontières (Doctors Without Borders), and the Red Crescent. When providing or preparing to provide support to the local populace, these organizations usually conduct assessments of the local areas that focus on understanding the needs of the local populace, the ability of the infrastructure to enable their support or aid to be effectively provided, and the general security situation or stability of the area. As with international organizations and IGOs, NGOs usually focus on urban areas at the hubs into which their support will flow and from which it will be distributed to the areas with the most urgent need.

3-52. NGOs strive to protect their shield of neutrality in all situations and do not generally offer copies of their assessments to government organizations, but it is often in their interest to make US forces aware of their operations in areas under US control. Representatives of individual NGOs operating in areas under US control may provide US forces with their detailed assessments of those areas in order to gain US support either in the form of additional material aid for the local populace or for security considerations.

3-53. Individual NGO members are often highly willing to discuss what they have seen during their operations with US forces personnel. Some NGOs have been used in the past as fronts for threat organizations seeking to operate against US forces. Intelligence analysts must therefore carefully evaluate information provided by NGO personnel.

LOCAL NATIONAL AUTHORITIES

3-54. Local national authorities and former local national authorities know their populations and local infrastructure best. Key information can be gained from cooperative local national authorities or former authorities. Analysts must always be careful to consider that these authorities may be biased for any number of reasons. Some examples of the types of information that local national authorities can provide are discussed below.

- Politicians usually know their populations very well or they would not be able to remain in office. They can provide detailed socio-cultural information on the populace within their region of control (for example, economic strengths and weaknesses or religious, ethnic, and tribal breakdowns). They are also usually aware of the infrastructure. Obviously, intelligence analysts must be aware that information provided by these personnel generally will be biased and almost certainly slanted in the long-term favor of that individual.
- Police can provide information on local criminal organizations, local ethnic breakdowns, and key terrain within their AOs. During stability operations, it would be useful to pay attention to the local police precinct boundaries when designating unit boundaries within an urban area. Dividing local national police boundaries between multiple US unit boundaries can cause liaison

problems and confusion on both sides whenever US forces have to work with local national police forces. Additionally, local national police forces will have been conducting operations in their urban environment prior to US operations and will have adjusted precinct boundaries into manageable sections based on the number of police personnel available, areas requiring concentration based on high criminal activity or unrest, and, where applicable, religious, ethnic, or tribal breakdowns.

- Fire department personnel often have ready access to blueprints of the structures within their precincts, information on fire escapes, and other building safety-related information as well as detailed information on their structural composition (and the fire threat in individual buildings or whole blocks of a city).
- Public works personnel are uniquely familiar with the infrastructure of the city. They can provide information on the critical points in the city that must be secured in order for public services to be maintained; they can provide key information on AAs throughout the city (especially underground service passages and sewer and drainage systems).
- City halls in many parts of the world are also repositories of key records on the infrastructure of the city. They may contain detailed maps of the city, key city infrastructure information, and blueprints of the buildings in the city.

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Chapter 4
Intelligence Collection Disciplines in the Urban Environment

4-1. The fluid nature of the urban environment creates a need for reliable and timely intelligence. This intelligence is difficult to acquire. A lack of human intelligence (HUMINT) assets in place, the effects of concentrations of buildings on the ISR efforts, the complexity and difficulty of providing specific details on the urban threat, and the lack of cultural information can compound the challenges to the collection of intelligence in an urban environment.

4-2. With knowledge of US collection techniques, enemies can use the environment to complicate allied intelligence-collection techniques. The amount of detail that needs to be collected in the urban environment and constant attention to focusing on the details that are significant in urban analysis in a particular situation creates further challenges for intelligence professionals. Current analysis tools and methods must be appropriately focused and developed to the level of detail required for the urban environment.

HUMAN INTELLIGENCE

4-3. HUMINT may be the most important and the most prolific type of intelligence gathered in the urban environment due to the population density. HUMINT collectors are trained to obtain information from people and multimedia to identify elements, intentions, composition, strength, dispositions, tactics, equipment, personnel, and capabilities within and affecting the urban area. HUMINT can help establish and understand the socio-cultural characteristics of the urban environment.

4-4. HUMINT sources can provide early warning of deep-rooted problems awaiting US forces in the urban environment. HUMINT collectors can conduct debriefings, screenings, liaison, HUMINT contact operations, interrogations, tactical questioning, and support document exploitation (DOCEX) in support of the commander's intelligence requirements.

4-5. Information provided by HUMINT assists the intelligence staff in deducing critical patterns and trends within the urban environment to assist with successful mission accomplishment. HUMINT collection team personnel provide these types of capabilities in support of tactical forces. The S-2X/G-2X/J-2X coordinates these capabilities between the tactical, operational, and strategic levels and can provide their units with access to pertinent national level HUMINT.

4-6. Intelligence staffs must be aware that operational environment cannot generally be defined in geographical terms for purposes of intelligence collection. This is especially critical when determining the allocation of HUMINT assets. Concentrations of humans on the battlefield do not necessarily denote a need to concentrate HUMINT assets in those locations. Threat actions outside an urban area may be a source of significant events inside the urban area. Additionally, information from sources in one city may impact operations in a distant city. Creating arbitrary intelligence boundaries can result in a lack of timely fusion of all critical elements of information that may be available.

4-7. During all combined arms operations, HUMINT collectors focus on collecting as much battlefield information as possible and pass it up the chain of command. In order to gain information from captured enemy personnel and pass it up the chain of command as quickly as possible, HUMINT collectors will need to be pushed forward to areas where we expect enemy personnel to be captured. During stability operations, HUMINT must be focused on providing quality reporting, not quantity reporting. In these operations, a large part of the information that HUMINT collectors will collect will be culture-related information, as well as perceptions and attitudes.

IMAGERY INTELLIGENCE

4-8. Analysis of any urban environment would be incomplete without the use of geospatial intelligence. Geospatial intelligence is the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth. It encompasses what has traditionally been categorized as imagery, IMINT, and geospatial data and information.

4-9. Imagery systems allow the commander to achieve both battlefield visualization and an awareness of the current situation. Imagery provides a visual situation report that can often identify the who, what, when, and where elements of intelligence analysis. As analytical tools, images help verify or refute key elements of a situation and given modern communication systems can often accomplish this in real time. After employing every precaution against deception, imagery analysis may provide the friendly commander with a distinct advantage over an adversary.

4-10. Organic imagery sensors respond directly to the tasking of the tactical commander. However, because of technical limitation or priorities established at the higher echelons, space-based and other national collection assets may not be available to the staff. Imagery may be collected either by overhead platforms or ground-based systems.

4-11. The conventional battlefield's requirement for high altitude and low oblique imagery is replaced by the need for close-up, nearly vertical overhead shots within the close surroundings of a major urban area. This forces collection managers and system operators to move expensive and scarce imagery collection systems closer to the target or to employ flight profiles that place them at greater risk from threat air defense systems.

4-12. UAS imagery may be one of the fastest, least risky methods by which to conduct reconnaissance of specific urban areas and to update and verify current maps of that urban area, showing clear routes, obstacles such as damaged and destroyed buildings, and intact and destroyed bridges. The topographical team can use this imagery to create updated mapping products for planning and operational uses.

4-13. Overhead imagery collection platforms face some serious challenges in the urban environment. Current systems are unable to see "inside" or "around" densely packed structures. Employing infrared or EO systems helps, but not to the extent necessary to adequately support urban operations. New systems—those able to see through walls and roofs or even micro-UASs capable of flying through openings in the structures then moving around freely to image building's interiors—are being designed but are still years away from fielding.

4-14. Overhead imagery, with some (minor) exception for infrared and EO, is only effective on exposed areas (for example, rooftops and streets). From the perspective of the ground assault force, overhead imagery only fulfills part of the ground combatants' requirements, forcing analysts to rely on hypotheses regarding approaches and the enemy's ability to defend given structures. Windows, doorways, and angled and recessed areas will not normally appear on overhead imagery or, if they do, offer somewhat distorted views. This leaves a requirement to supplement overhead imagery in the urban environment with a reliable vehicle-mounted or handheld imaging system.

4-15. Cameras collocated with measurement and signature intelligence (MASINT) systems, such as the remotely monitored battlefield surveillance system (REMBASS), and activated when those systems are triggered can give the commander additional "eyes on" NAIs without wasting manpower by continuously staffing an observation post in those locations.

4-16. Providing patrols with a digital camera or video camera can greatly assist in the debriefing process and allow the intelligence staff personnel to make their own judgments about items of interest that the patrol reports. Videotaping of events, such as a demonstration, can allow analysts who were not on the scene to identify key elements, leaders, and potential indicators to help preclude future incidents. Gun-camera images from aircraft that can provide a stand-off reconnaissance platform may give valuable insight

into enemy TTP. Thermal sights on a vehicle patrolling an urban street late at night may note the hot engine of a vehicle on the side of the road, possibly indicating suspicious activity.

4-17. The Joint Surveillance Target Attack Radar System (JSTARS) could provide such information as the amount of vehicular traffic entering and leaving a city via multiple avenues; this information could be useful when trying to determine if the enemy is shifting forces into or out of the city or if there is a covert attempt to exfiltrate or infiltrate the city via lesser-used avenues.

4-18. The NGA can provide a wide range of imagery products for use prior to and during operations in the urban environment. These products are usually easier to obtain prior to deployment and are often critical to the initial planning stages of an operation. Chapter 3 listed some of the available products.

SIGNALS INTELLIGENCE

4-19. As noted in Chapter 1, the urban environment has a significant effect on signals, both friendly and threat. Structures and infrastructure can affect such things as signal strength and direction. In terms of collecting SIGINT, this means that comprehensive electronic preparation of the battlefield must be developed during the military decision-making process (MDMP). Refer to TC 2-22.602 and TC 2-2603 (both classified) for a discussion of SIGINT uses in the urban environment.

MEASUREMENT AND SIGNATURE INTELLIGENCE

4-20. MASINT technology has the potential to be used in all types of military operations. This capability will enable Commanders to effectively detect adversary actions; accurately assess the actions in order to begin working inside the adversary's decision cycle to develop actionable intelligence; warn friendly forces in a timely manner; direct focused tasks in order to defend against adversary attacks.

4-21. In urban operations it may be impossible to place an area under manned surveillance because the mere presence of Soldiers alters the patterns of activity in a given area; because the dangers present in a given area preclude constant Soldier presence; or for other reasons. Unattended ground sensors provide units with the means to surveil areas where it may not be possible or desirable to employ troops for this purpose. As the sensors are triggered they report information which includes personnel and vehicle numbers, movements, activity, and direction of travel. The sensors can be used to monitor entry point activity and cleared area activity (for example, around buildings of interest). The sensors can also be organized into a network that is capable of target detection, location, tracking, classification, and identification.

4-22. MASINT systems must be incorporated into the ISR plan in order to be employed effectively. Incorporation into a comprehensive ISR Plan ensures that the systems are tied to a collection plan that supports the commander's intent and is focused on answering priority intelligence requirements (PIRs). When employing MASINT systems, units must conduct comprehensive mission planning. Personnel employing the MASINT systems must be aware of the specific indicators that the sensors are intended to detect so that the sensors can be emplaced appropriately, as well as being properly trained on emplacing the sensors.

4-23. MASINT technology can be used in both ISR and protection roles. Examples include the Weapon Surveillance System (WSS), which has the capabilities to provide a 120-degree field of view, and can be set up either stationary or mounted on a moving vehicle. The WSS detects, isolates, and provides lines of bearing (LOBs) for azimuth and elevation, and geo-locates sniper fires. There are currently systems deployed in support of Operation Iraqi Freedom. The WSS can be deployed stand-alone; queued by other sensors; or used to queue other sensors or weapon systems.

4-24. MASINT technology is also being used with the Unattended Transient Acoustic MASINT Sensor (UTAMS). UTAMS is a 2- to 4-sensor array linked via radio to a base station that provides LOBs from each array on the map display of the base station. Each sensor station consists of a 4-microphone acoustic

array, GPS antenna, radio w/antenna, humidity sensor, signal processing box, and power box. The base station consists of a Panasonic Toughbook laptop, radio, and antennas. The system is useful in tracking events such as gunfire, IED and vehicle-borne IED explosions and localizing their location before reports can be received from troops on the ground.

4-25. REMBASS and ground surveillance radar (GSR) systems are still in the inventory but are actively being replaced by unattended ground sensors. Unattended ground sensors use MASINT technology to obtain information concerning the operational environment by locating, tracking, identifying, and describing unique characteristics of fixed and moving targets. This capability will move intelligence collection capabilities forward into the tactical maneuver forces.

4-26. The set of unattended ground sensors are modular providing a tailorable group of sensors utilizing multiple ground sensing technologies. These systems include the Omni Sense, which includes the following systems and capabilities: acoustic, seismic, magnetic, passive-infrared, imaging EO camera, imaging infrared camera, and is supported through iridium satellite communications architecture. The Scorpion has EO and infrared cameras (long-range imager), seismic, acoustic, passive-infrared, and magnetic cueing sensors, and communicates via the iridium satellite network; and the Silent Watch (non-imaging activity detection sensor) has seismic and passive-infrared activity sensors and communicates via a gateway through the iridium satellite network. These systems are currently being fielded to both Operation Enduring Freedom and Operation Iraqi Freedom units.

4-27. Units may employ unattended ground sensors in a variety of roles and missions to shape the AO, set conditions for maneuver, and perform economy of force missions. The mission sets include remote early warning (including CBRN early warning); non-contiguous area overwatch; reconnaissance, surveillance, and target acquisition perimeter security; protection, and survivability. Examples of how units may employ unattended ground sensors include—

- Coverage of point and area named areas of interest (NAIs) either as a single asset or in conjunction with other manned and unmanned sensors.
- Integrated CBRN smart sensors to provide detection capability of a release from WMD production or storage facilities as part of ISR coverage of an NAI or post-strike battle damage.
- Surveillance of mounted and dismounted AAs outside urban areas to facilitate condition setting for the tactical assault.
- FP and area observation, and ISR operations within urban and jungle areas for dismounted infantry operations.
- Ground reconnaissance efforts by maintaining sensor contact and allow Soldiers to continue performing other reconnaissance tasks.
- Flank security for more static key assets such as the forward support base, aviation assembly areas and forward arming and refueling points..
- Screen missions, deception actions and gray space coverage within the unit's area of influence as an economy of force role.

COUNTERINTELLIGENCE

4-28. Counterintelligence (CI) is focused on countering threat intelligence collection activities against US forces. In urban operations, CI personnel will primarily investigate collection threats and, in conjunction with other elements (Provost Marshal's Office, Engineers, others) provide protection assistance (see AR 525-13 and related manuals). CI agents will conduct screening operations to identify personnel that may be of CI interest or have CI leads. (NOTE: As appropriate, those inquiries will be pursued separate from standard collections and debriefings, if they become investigations or operations.) CI teams are most effective when provided with properly cleared linguist support when operating with the local populace

4-29. CI screening is also conducted during the process of hiring host nation (HN) citizens (such as linguists) for Army or DOD employment; however, the Army CI screening is a supplement to the

screening that is to be conducted by the employer—the employer is not relieved of screening responsibility. CI investigations and operations may cross-cue the other intelligence disciplines, but are more likely to be cross-cued by the other disciplines. CI personnel work in conjunction with the Military Police, Engineers, Medical Service personnel, and others as required, to create threat assessments and vulnerability assessments which provide commanders with a comprehensive FP assessment, comparing pertinent threat capabilities to existing conditions.

4-30. CI as a discipline provides analysis of the threat's HUMINT, IMINT, and SIGINT capabilities in support of intelligence collection, terrorism, and sabotage in order to develop countermeasures against them. However, with the elimination of the 97G MOS, these actual functions transfer to theater analytical centers, not agents on the ground in a specific theater. CI analytical products are an important tool in enemy COA and COA development in the MDMP.

4-31. CI technical services that may be available and of use in the urban environment include the following:

- Surveillance.
- Computer network operations (CNO); for example, assisting in protecting US information and information systems while exploiting and/or attacking adversary information and information systems. However, this support is at theater level, through such elements as the Information Dominance Center.
- Technical surveillance countermeasures, which is the identification of technical collection activities conducted by adversary intelligence entities.

4-32. The counter-signals intelligence (C-SIGINT) is a CI disciplinary function carried out by the SIGINT community.

GEOSPATIAL INTELLIGENCE

4-33. There are many producers of Geospatial Intelligence (GEOINT), and the users of GEOINT extend from the national level down to the lowest tactical level. The overall GEOINT enterprise that supports operations extends across all Services, multinational partners, and other organizations during joint operations and unified action. GEOINT requirements, methods of collection (and associated systems), and products vary widely based on the echelon of support and the various types of operations including daily cooperative security, pre-hostility crisis, major combat operations, and post-conflict stability operations.

4-34. The goal of Army GEOINT operations is to provide products that facilitate the commander's gaining an improved situational understanding. As stated in NGA Publication 1:

> *Advances in technology and the use of geospatial data have created the ability to integrate and/or combine elements of any or all of the areas, along with other elements of information, resulting in many new, more sophisticated capabilities for producing products and conducting analysis… Advanced technology now provides the capability to use and combine geospatial data in different ways to create interactive/dynamic, customized visual products. It allows analysts to quickly make more connections between different types of data and information than previously possible.*

4-35. GEOINT is major step toward improving Army intelligence and intelligence operations.

TECHNICAL INTELLIGENCE

4-36. Technical Intelligence (TECHINT) can be critical to intelligence analysis in the urban environment. TECHINT is intelligence derived from the collection and analysis of threat and foreign military equipment and associated materiel for the purposes of preventing technological surprise, assessing foreign scientific and technical capabilities, and developing countermeasures designed to neutralize an adversary's technological advantages.

4-37. Weapons technical intelligence (WTI), which is a subcomponent of TECHINT, focuses on weapons (such as IEDs) exploitation, and is an instrumental facet of intelligence support in an urban environment. Each weapons intelligence team (WIT), as a part of WTI, conducts scene analysis of weapons usage incidents and collects forensic evidence and device components, rendered safe by EOD personnel, from locations where weapons are discovered. WITs serve as advisors on WTI to local area commanders and are trained in the collection of latent fingerprints and DNA evidence. WITs conduct initial review of collected material and then forward the material to the combined explosives exploitation cell for further exploitation.

4-38. In an urban environment, TECHINT can—

- Collect weapons components or materials for further analysis.
- Populate databases that track different types of weapons and can link weapons to a known or suspected maker based on materials and methods used in its construction.
- Analyze found or captured materials to determine if they are in fact weapons precursors.
- Analyze current weapons construction and initiation methods.
- Predict weapons trends and likely future construction and initiation methods.
- Assess possible sources of weapons components based on forensic analysis.
- Assist in linking captured personnel to weapons activity based on forensic evidence.

OPEN-SOURCE INTELLIGENCE

4-39. Although Open Source Intelligence (OSINT) is considered an intelligence discipline, there are no Army intelligence personnel specifically trained as open source intelligence operators or analysts. OSINT can be an important source of information for intelligence analysts. There are numerous sources of open source information. The difficulty for analysts is being able to narrow down their searches to specific information that is relevant to ongoing or future operations. FMI 2-22.9 provides a good reference for open source resources.

4-40. Open sources and publicly available information may include but are not limited to—

- Academia. Courseware, dissertations, lectures, presentations, research papers, and studies in both hardcopy and softcopy on economics, geography (physical, cultural, and political-military), international relations, regional security, science, and technology.
- Governmental, Intergovernmental, and NGOs. Databases, posted information, and printed reports on a wide variety of economic, environmental, geographic, humanitarian, security, science, and technology issues.
- Commercial and Public Information Services. Broadcasted, posted, and printed news on current international, regional, and local topics.
- Libraries and Research Centers. Printed documents and digital databases on a range of topics as well as knowledge and skills in information retrieval.
- Individuals and Groups. Handwritten, painted, posted, printed, and broadcasted information (for example, art, graffiti, leaflets, posters, and websites).

4-41. The Internet offers quick access to numerous types of information on urban environments, especially during the initial IPB conducted immediately following a warning order that identifies a potential AO that consists of or includes urban areas. Maps and general urban information generally are available on all major urban areas of the world. The open-source information available on these urban areas ranges from tourist-type information to detailed governmental and military information, as well as detailed urban studies (for example, population distribution and movement, infrastructure evaluations) of all sorts for many urban areas.

4-42. A good first site at which to begin your search for open source content is the Intelink-SBU (sensitive but unclassified) homepage. Intelink-SBU is a virtual private network managed by the Intelink Management Office which provides authorized users access to unclassified and for official use only information from both the US Government and commercial sources. If your unit does not already have access to the Intelink-SBU network, contact them at info@center.intelink.gov, and they can assist you in gaining access. For operations security reasons, the site is not accessible directly from the Internet and requires password authentication for access.

4-43. Several US government-run sites are accessible from the Internet, but require registration to obtain a username and password for site access:

DIRECTOR OF NATIONAL INTELLIGENCE OPEN SOURCE CENTER

4-44. The Director of National Intelligence Open Source Center (OSC) (formerly the Foreign Broadcast Information Service) was created in November 2005. The OSC monitors open sources in more than 160 countries in over 80 languages and acquires open source data worldwide for organizations across the military and government, down to local law enforcement. The OSC analyzes the content and behavior of the media and Internet websites of nations and other international actors of significant policy interest to the US Government. These contextual and analytical products, categorized as OSC Analysis and OSC Media Aids, are available on Opensource.gov (the site requires a registration to obtain a username and password), the OSC websites hosted on government-sponsored communications systems, including SIPRNET and JWICS.

4-45. OSC products and services include—

- Analysis. OSC analyses range from short, time-sensitive products that explain the media treatment of issues on the US Government policy agenda to longer analytic pieces that examine issues or the content and behavior of a set of media over time to detect trends, patterns, and changes related to US national security interests.
- Media Aids – Media Guide. Media guides offer a comprehensive characterization of the media of a country or region and provide an overview or characterization of the larger media environment, including what makes up the media of a country, how that media operates, who uses the media and how they use it, and other factors (such as literacy rates, press laws, economic status, and demographics) that affect the media and their behavior or use.
- Media Aids – Commentator Profile. Commentator profiles provide detailed information on one or more media personalities in a particular country, outlining their influence, background, views, and biases on key topics. The focus is on personalities who speak or write about issues of importance to the United States or who have influence with their government, businesses, or large segments of the general population.
- OSC Reports. Through its worldwide access to foreign media and other publicly available material, the OSC provides translations and transcriptions of the latest political, military, economic, and technical information gleaned from foreign open sources. Reports gist from select sources, such as jihadist websites or daily editorials, on topics related to the National Intelligence Priorities.
- Video Services. Video Services Division collects, analyzes, and disseminates more than 550 channels of foreign and domestic television and Internet video for 24 hours a day, 7 days a week

to military and Intelligence Community customers. Video Services Division can access, via OSC's international collection network, between 16,000 and 34,000 additional channels. Video Services Division archives over 1.6 million hours of video per year and has a library containing 10,000 hours spanning 45 years. The Video Server System provides access to foreign video at the desktop. The capabilities of the system include keyword searching, English closed captioning, speech-to-text transcripts, thumbnail program scanning, video on demand, unlimited archive capability, still photographs from video, multiple customizable topic profiling, and online ordering. The Video Server System hosts a nearly 2-year archive of web-accessible video. Military customers can access the unclassified Video Server System hosted on the Open Source Information Service network or request delivery via videotape, digital video device, or compact disc.

- Map Services. OSC geographers are experts on foreign mapping, geographic information, and geospatial technologies. The Maps Services Center provides maps, data, information, analytical products, training and a host of related geographic services to those on the front lines of intelligence. Map Services Center maintains the community's central repository of hundreds of thousands of foreign maps and geographic data.

EARLY BIRD

4-46. The DOD also publishes a daily (weekday) summary of US print media stories of interest to DOD personnel called the Early Bird. The Early Bird is published online at http://ebird.afis.mil/.

4-47. Early Bird summaries can provide intelligence analysts with an insight into the views of local nationals and government in an urban area and its surroundings, as well as the views of other countries and factions within the region which could impact those operations.

DEPARTMENT OF THE ARMY INTELLIGENCE INFORMATION SERVICE

4-48. The Department of the Army Intelligence Information Service (DA-IIS) maintains a webpage with links to multiple open-source intelligence websites. The DA-IIS Portal on the AKO website is located at https://www.us.army.mil/suite/page/132281 (the site requires an AKO username and password). The Portal has links to News Media websites, country research sites, Intelligence Community websites, Analyst Reference websites, and Unified Command websites.

4-49. When dealing with open-source intelligence, intelligence professionals must consider the reliability, credibility, and biases of each source of information as well as whether the collection or retention of the information through open sources is done in compliance with AR 381-10.

GEOSPATIAL INFORMATION

4-50. In the urban environment, map reconnaissance is insufficient to provide all of the information necessary to conduct operations. Analysts of all intelligence disciplines will need to supplement their intelligence with information from geospatial sources in order to conduct mission analysis and support tactical operations. This information will be critical to successful planning and execution of operations in the urban environment.

4-51. Geospatial information sources can provide the following:

- Terrain databases.
- Special terrain studies and products prepared by US or HN agencies, and special maps, charts, and geodetic studies.
- Real-time terrain reconnaissance.
- Terrain factor matrices.

Chapter 5
Operations in the Urban Environment

5-1. In the urban environment, different types of operations (offense, defense, and stability) will often occur simultaneously in adjacent portions of a unit's AO—this has sometimes been referred to as the three-block war. Intelligence support to operations in this extremely complex environment often requires a higher degree of specificity and fidelity in intelligence products than required in operations conducted in other environments. Intelligence sections have finite resources and time enabling them to accomplish their support mission. Realistically, intelligence sections may not always expect to be able to initially provide the level of specificity and number of products needed to support commanders.

5-2. Using METT-TC, G-2s/S-2s must start prioritizing by focusing on the commander's and operational requirements to create critical initial products. Requests for information to higher can assist lower-level intelligence sections in providing critical detail for these products. As lower-level intelligence sections create products or update products from higher, they must provide those products to higher so that higher can maintain an awareness of the current situation. Once initial critical products have been built, intelligence sections must continue building any additional support products required. Just as Soldiers continue to improve their foxholes and battle positions the longer they remain in place, intelligence sections must continue to improve and refine products that have already been built.

5-3. When preparing for operations in the urban environment, intelligence analysts must consider the three primary characteristics of the urban environment as well as the threat. These factors have been discussed throughout this manual, but a general review is provided in table 5-1. Commanders and their staffs must have a good understanding of the civil considerations for the urban area as well as the situation in the surrounding region. This includes the governmental leaders and political organizations and structures, military and paramilitary, economic situation, sociological background, demographics, history, criminal organizations and activity, and any non-governmental ruling elite (for example, factions, families, tribes). All are key factors although some are more important than others depending on the situation in the target country. Intelligence personnel must assist the commander in correctly identifying enemy actions so that US forces can focus on the enemy and seize the initiative while maintaining an understanding of the overall situation.

5-4. Since urban areas are often closely connected with other urban areas and surrounding rural areas by physical terrain, socio-cultural factors, and/or infrastructure, operations within any given urban area should not be considered in isolation. Events or activities that occur in other urban or rural areas may have a direct impact on events or activities in the urban AOs for which a unit is responsible.

5-5. Most operations in urban environments will be conducted by brigade-size or smaller units and often in a joint context. This chapter focuses primarily on these tactical units.

PLAN

5-6. During the planning phase of operations in an urban environment, intelligence plays a major role. Initial collection of information and IPB is undertaken to provide intelligence products for the MDMP.

5-7. The basic factors that must be considered in the complex urban environment remain the same regardless of the type of mission that US forces are conducting. The priority given to individual factors, however, will change based on the type of mission and specific situation.

Table 5-1. Basic intelligence consideration factors in the urban environment

Enemy: Snipers, Molotov cocktails, squad size engagements, bunkers, reserves, IO, health threats, OB, COA.

Terrain:

- OAKOC Factors – Observation and fields of fire, concealment and cover, obstacles, key terrain, avenues of approach.
- General Urban Description – Large or small city, town, village, strip area.
- Zoned Areas – Core, residential, high rise, industrial.
- LOCs – Roads, rivers or canals, railways, subways, airfields, ports, line of sight and rubble effects.
- Urban Patterns – Hub and satellite, linear, network, segment, pie-slice patterns.
- Street Patterns – Type of pattern.
- Street Pattern Effects – Blocking, funnel-fan, funnel effect.
- Structural Types – Type, construction and layout of buildings.
- Mobility Corridors – Air, intrasurface (buildings and rooftops), surface, and subsurface characteristics of the urban area.

Weather: Weather effects in the urban terrain (wind, visibility, wind chill).

Civil Considerations:

- Socio-cultural factors – Religious, ethnic, cultural, political, and demographic.
- Infrastructure – Transportation, fuel, electricity, water, communications.

MAPS

5-8. Acquisition of maps at the beginning of or prior to the planning phase is critical. While not an intelligence function, intelligence staff personnel often are the first to obtain maps simply because they are required in order to conduct the initial IPB. For urban operations, maps in the normal military scales of 1:250,000, 1:100,000 or even 1:50,000 are not usually adequate given the level of detail and specifics required in urban operations. Smaller-scale maps are usually required.

5-9. NGA produces 1:25,000 scale maps down to about 1:10000 scale maps for specific urban areas. Maps are normally procured through the unit supply system. The unit supply section should have the NGA standard products catalog on compact disk (NSN: 7644-01-478-4783). Updates to this catalog are sent out monthly from the Defense Logistics Agency to units. In addition, Engineer topographic teams normally have the latest digital products for the specific AO and can produce many specialized products. Also, the NGA representative (normally at Corps and Regional Combat Command levels) or NGA support team—deployed to support specific operations—can obtain digital map and imagery data on compact disks for the AO specified by the customer.

5-10. Commercially available civilian or tourist maps may show greater and more current urban detail than military maps. While street maps and tourist maps do not normally show terrain, they often provide useful information on current street and bridge locations, street names, shapes of prominent buildings, and cultural features. Civilian maps usually have a reference grid overlay that, if available in sufficient quantities, may be useful as a supplemental terrain reference during urban operations. However, these maps do not come marked with the MGRS or Universal Transverse Mercator (UTM) references. Although marked with a common reference grid, commercial maps or charts should not be used as a reference for employing munitions. Ensure all units disseminate any approved nonstandard reference systems to enable proper target identification and fratricide prevention.

5-11. Always check the reference system used to prepare a map or chart (for example, World Geodetic System 1984 [WGS-84], Tokyo Special). Different datum can cause significant confusion and errors.

PLANNING CONSIDERATIONS

5-12. When planning for intelligence support to operations in the urban environment, the following must be accomplished:

- Define priorities for intelligence collection.
- Coordinate for movement of ISR assets.
- Coordinate for information and intelligence flow with all military intelligence (MI) units, non-MI units, other service components and multinational organizations.
- Establish liaisons with all elements, organizations and local nationals necessary for mission accomplishment and FP.

5-13. One of the major factors when planning for most operations in urban environments is the local population and their potential effect on US operations. Intelligence personnel must be cognizant of local national perceptions of US forces, their environment, and the nature of the conflict. To engage successfully in this dynamic, US forces must avoid mirror imaging; that is, imposing our own values on the threat COAs. This can be done through careful study of the threat country, collaboration with country experts, and through the use of people with pertinent ethnic backgrounds in the wargaming process.

5-14. The relative interests of population groups in and around the urban environment must be identified and a continuous process employed to immediately identify changes in the environment that may result in changes to the population group's relative interests. Population groups and the relationships among them are not static. Group intentions and relationships change as conditions and other relevant relationships change. The local population in the urban environment will usually need to be protected and sustained by friendly forces.

5-15. The ISR plan must be as detailed as possible and must be regularly reviewed for changes during operations in constantly changing urban environments. The finite intelligence collection resources available to any command must be feasibly allocated and reallocated as often as necessary in order to keep up with the fluid urban environment. Employing these assets within their capabilities, taking into consideration their limitations within the urban environment, is critical to ensuring that a focused intelligence effort is successful. The ISR plan must be synchronized with the air tasking order, as air platforms are coordinated on the same timeline.

PREPARE

5-16. During the preparation phase of the operations process, intelligence staffs and collection assets must further refine their products, collection plans, and reporting procedures. Establishing and testing the intelligence architecture (to include joint and multinational elements) is a critical activity during this phase. Intelligence staffs must ensure that all intelligence personnel are aware of the current situation and intelligence priorities are fully trained on both individual and collective tasks, and are aware of any limitations within the intelligence architecture that are relevant to them.

5-17. Additionally, intelligence staffs must ensure that targeting procedures are well-defined and executed. In urban environments, non-lethal targeting may be more prevalent than lethal targeting and must be fully integrated into the process.

EXECUTE

5-18. Execution of operations in urban environments requires continuous updating and refining of intelligence priorities and ISR and collection plans as the situation changes in order to provide the necessary intelligence to the commander in a timely manner. Timely reporting, processing, fusion, analysis,

production, and dissemination of critical intelligence often must be done within a more compressed timeline in the fluid and complex urban environment than in other environments.

5-19. Large amounts of information are generally available for collection within the urban environment. Procedures must be set in place to sort the information to determine what is relevant and what is "noise."

5-20. Reported information must always be carefully assessed and verified with other sources of intelligence and information to avoid acting on single-source reporting. In stability operations and civil support operations where HUMINT is the primary source of intelligence, acting on single-source reporting is a constant pitfall. Situations may occur, however, where the consequences of not acting on unverified, single-source intelligence may be worse than any potential negative consequences resulting from acting on that unverified information.

ASSESS

5-21. As previously stated, operations in the urban environment, especially stability operations and civil support operations, can be extremely fluid. The intelligence staff must constantly reevaluate the TTP of US forces due to the rapid changes in the situation and the threat's adaptation to our TTP. New threat TTP or potential changes to threat TTP identified by intelligence analysts must be quickly provided to the commander and operations staff so that US forces TTP can be adjusted accordingly.

5-22. Intelligence staffs must continue to evaluate and update ISR plans based on changes in the urban environment, changes in enemy TTP, and assessments of what ISR operations were successful in the urban environment. Continuous IPB updates and constant reevaluation of the relative interests of potential threats are essential.

5-23. It is essential to regularly brief and debrief personnel who will collect and report information of potential intelligence value (see Chapter 3). All military personnel should be clearly briefed on intelligence collection priorities and why those collection priorities are important so that they will be alert to these items while they are conducting their missions. They must be encouraged to report anything they determine might be unusual and reminded of their reporting chain of command. Critical information that S-2s/G-2s obtain from this reporting must be passed up the chain of command in a timely manner so that higher maintains an awareness of the current situation.

5-24. Debriefing military personnel is crucial to getting information that they obtained into intelligence channels for evaluation and analysis. It is not necessary or even possible for MI personnel to personally debrief everyone in the unit on a regular basis; however, it is important to develop a standard debriefing format for the unit to ensure that persons conducting debriefings are thoroughly familiar with both the intelligence requirements and the standard debriefing format.

5-25. There are multiple methods of debriefing personnel. (Refer to FM 2-91.6.) One method is a walk-through of the mission from start to finish with the persons being debriefed simply being coached by the debriefer using checkpoints along the route taken to divide the discussion into specific terrain slices. An example debrief format, based on the patrol report format shown at figure B-8, is set up for patrols that are sent out with digital cameras that can take pictures of relevant items (route conditions, vehicles of interest, unusual items encountered during the patrol) and then be downloaded in the S-2 section upon completion of the patrol.

5-26. Debriefing must occur as soon as possible after the completion of a mission to ensure that the information is obtained while it is still fresh in the Soldiers' minds and to ensure that time-sensitive information is reported to intelligence channels immediately.

Appendix A

Urban Intelligence Tools and Products

A-1. The urban environment offers the analyst many challenges normally not found in other environments. The concentration of multiple environmental factors (high rises, demographic concerns, tunnels, waterways, and others) requires the intelligence analyst to prepare a detailed plan for collecting information within the urban environment.

A-2. There are numerous products and tools that may be employed in assessing the urban environment. Due to the complex nature of the urban environment, these tools and products normally will be used to assist in providing an awareness of the current situation and situational understanding.

A-3. The tools and products listed in this appendix are only some of the tools and products that may be used during operations in an urban environment. For purposes of this appendix items listed as tools are ones generally assumed to be used primarily within intelligence sections for analytical purposes. Products are generally assumed to be items developed at least in part by intelligence sections that are used primarily by personnel outside intelligence sections.

TOOLS

A-4. There are numerous software applications available to the Army that can be used as tools to do analysis as well as to create relevant intelligence products for the urban environment. These software applications range from such programs as Analyst Notebook and Crimelink which have link analysis, association matrix, and pattern analysis software tools to the Urban Tactical Planner (UTP), which was developed by the Topographic Engineering Center as an operational planning tool and is available on the Digital Topographic Support System. The focus of this section, however, is on the types of tool that could be used in the urban environment rather than on the software or hardware that may be used to create or manipulate them.

PATTERN ANALYSIS

A-5. Pattern analysis includes multiple map overlays and text assessing military, terrorist, or other threat activity in an urban area. These events can be related by any of several factors to include location and time. These events can be analyzed by plotting them on maps over time, using multiple historical overlays (analog or digital) that can be compared to one another over time, and using a time-event wheel or other analysis tools. (See figure A-1.)

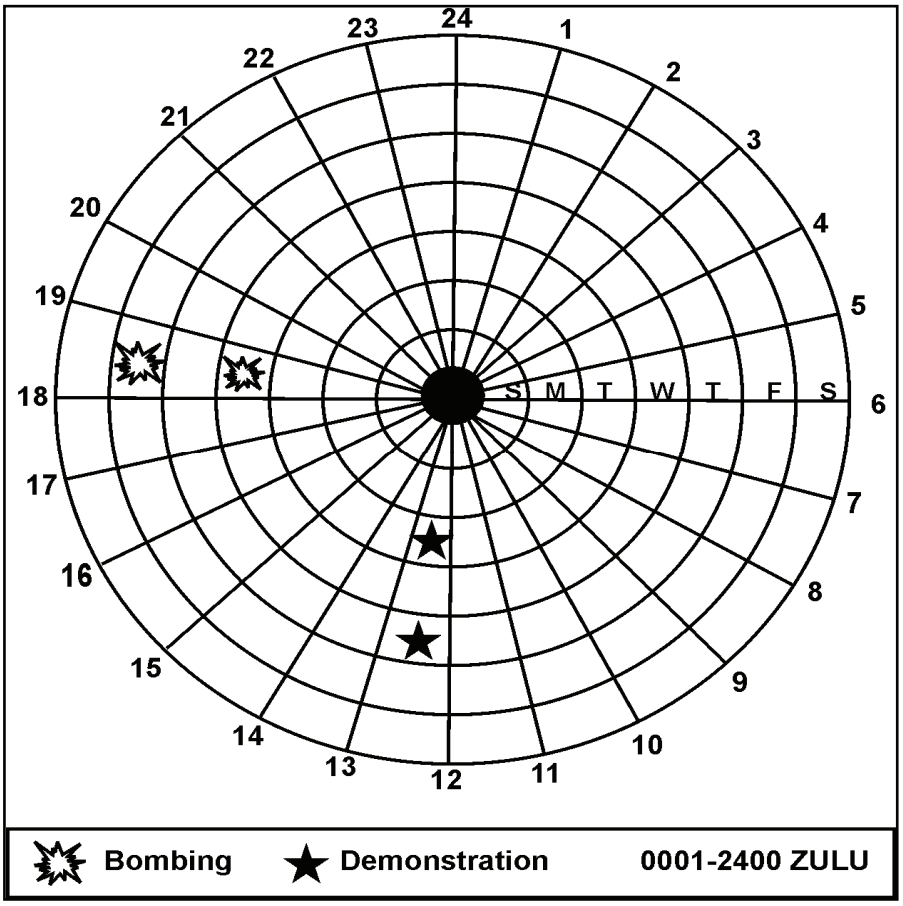


Figure A-1. Example pattern analysis plot sheet

LINK ANALYSIS TOOLS

A-6. Link analysis is used to depict contacts, associations, and relationships between persons, events, activities, and organizations. Five types of link analysis tools are—

- Link Diagrams.
- Association Matrices.
- Relationship Matrices.
- Activities Matrices.
- Time Event Charts.

Link Diagrams

A-7. This tool seeks to graphically depict relationships between people, events, locations, or other factors deemed significant in any given situation. Link diagrams help analysts better understand how people and factors are interrelated in order to determine key links. (See figure A-2.)

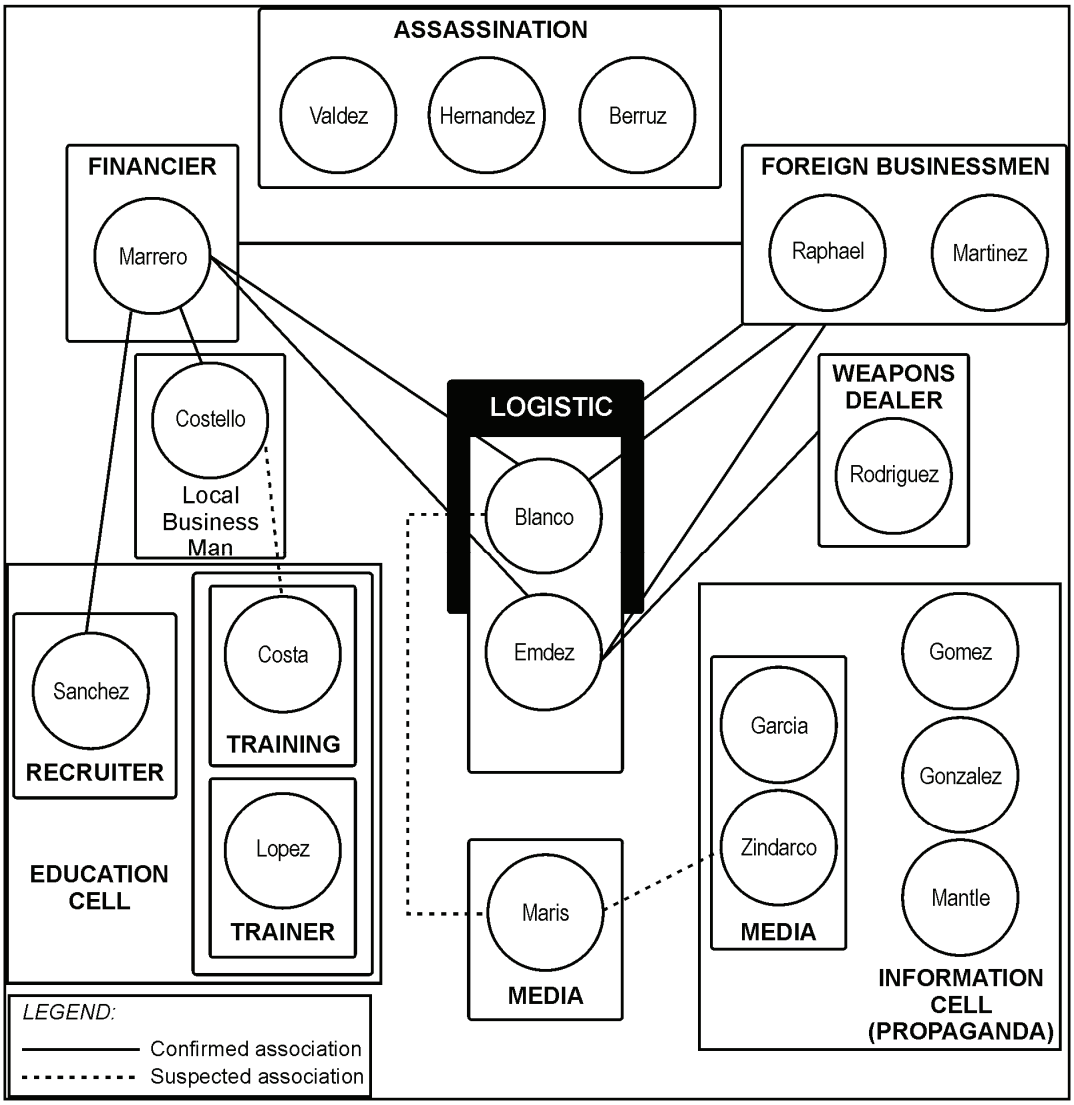


Figure A-2. Example link diagram

Association Matrix

A-8. The association matrix is used to establish the existence of an association between individuals. Figure A-3 provides a one-dimensional view of the relationships and tends to focus on the immediate AO. Analysts can use association matrices to identify those personalities and associations needing a more in-depth analysis in order to determine the degree of relationship, contacts, or knowledge between the individuals. The structure of the threat organization is formed as connections between personalities are made.

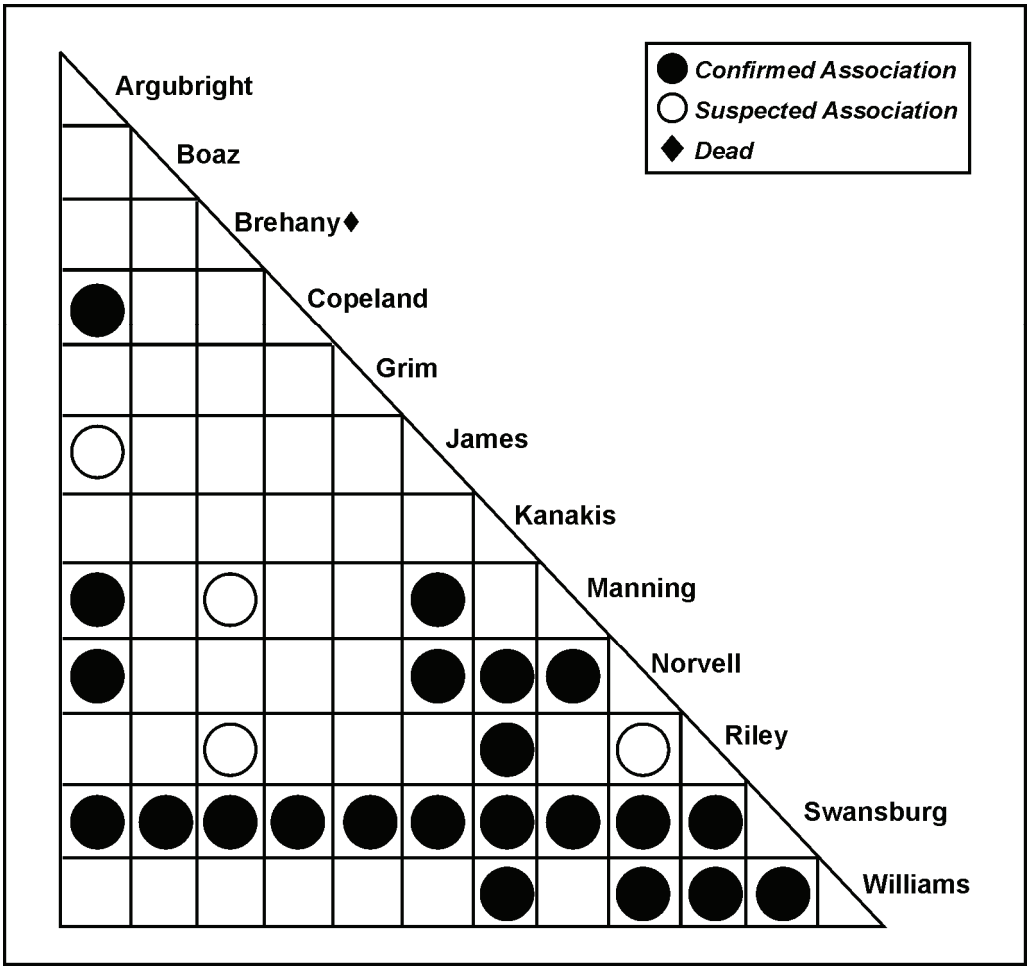


Figure A-3. Example association matrix

Relationship Matrix

A-9. Relationship matrices are intended to depict the nature of relationships between elements of the operational area. The elements can include members from the noncombatant population, the friendly force, international organizations, and an adversarial group. Utility infrastructure, significant buildings, media, and activities might also be included. The nature of the relationship between two or more components includes measures of contention, collusion, or dependency. The purpose of this tool is to demonstrate graphically how each component of the city interacts with the others and whether these interactions promote or degrade the likelihood of mission success. The relationships represented in the matrix can also begin to help the analysts in deciphering how to best use the relationship to help shape the environment.

A-10. The example relationship matrix shown in figure A-4, while not complete, is intended to show how the relationships among a representative compilation of population groups can be depicted. This example is an extremely simple version of what might be used during an operation in which many actors and other population elements are present. For instance, the section marked "Population" might include considerably more population subgroups than the two included in this sample. When used during a deployment, it is important for the analysts to realize what groups, subgroups, and other elements should be represented in the matrix. In addition, it should be noted that the matrix could be used to depict the perceived differences in relationships. For example, in figure A-4 Political Group 3 is shown to have a dependent relationship

with Economic Group 1. The complementary relationship (a similar mark in the corresponding box linking Political Group 3 and Economic Group 1) is not indicated because it might not exist.

A-11. To illustrate the usefulness of the matrix, consider the relationship of the government with the infrastructure. In this case, the relationship is "friendly," perhaps because the government is in control of the infrastructure without contest from the owners or suppliers of the infrastructure. For example, this could be considered the case when Slobodan Milosevic controlled the electricity supply for Kosovo. He apparently used the infrastructure at his disposal to supply electricity to the population, but intermittently threatened to deny the service in order to maintain control over a possibly hostile population. How can this information be used by the commander and his staff? Perhaps by understanding the nature of two components of the operational environment, the link between the two elements can either be eliminated or leveraged in order to suit the needs of the friendly unit.

A-12. Using figure A-4, there is a relationship of possible collusion that exists between the government and Political Group 3, and a friendly relationship between the government and the media. Some questions the intelligence analyst might ask when reviewing this information include:

- How can the government use the media to its advantage?
- Will the government seek to discredit Political Group 3 using the media?
- Will the population view the media's reporting as credible?
- Does the population see the government as willfully using the media to suit its own ends?

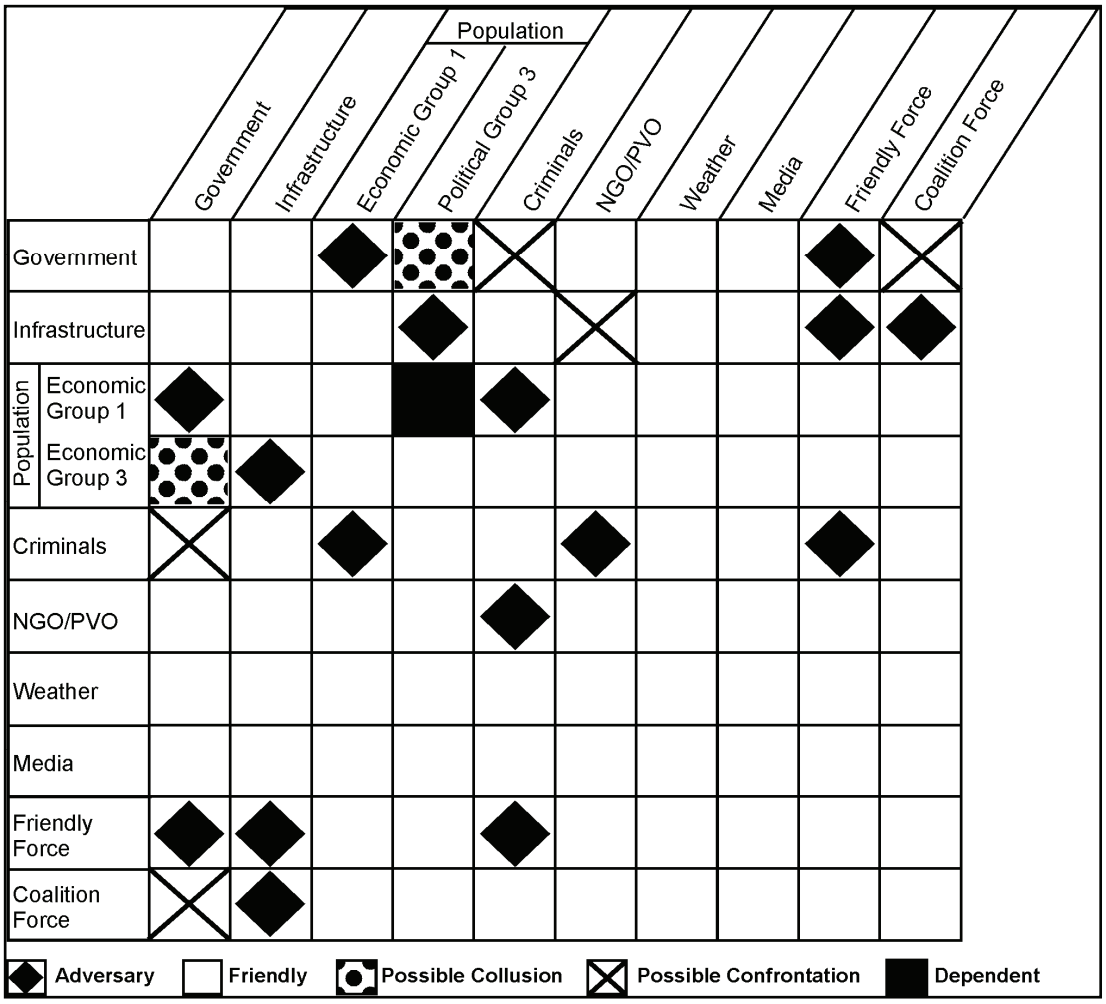


Figure A-4. Example relationship matrix

Activities Matrix

A-13. Activities matrices help analysts connect individuals (such as those in association matrices) to organizations, events, entities, addresses, and activities—anything other than people. Information from this matrix, combined with information from association matrices, assists analysts in linking personalities as well. (See figure A-5.)

Legend: ● Known association; ○ Suspected or "weak" association; ♦ Dead	Remarks	Death Squads	Drug Trafficking	Arms Smuggling	Support Terrorism	Politician	Name of Individual
	Ambitious, wants to become President.	○				●	Argubright
			●				Boaz
	Constantly persecuted possible inside ally.	●		●			Brehany♦
	Crafty and very diplomatic.	●			○	●	Copeland
		●			●	●	Grim
Warrant	Known to have conducted executions.	●			●		James
			●	●		●	Kanakis
Warrant						●	Manning
				●	●		Norvell
	Tactical genius.	○					Riley
		●				○	Swansburg
		●				●	Williams

Figure A-5. Example activities matrix

Time Event Charts

A-14. Time event charts are chronological records of individual or group activities designed to store and display large amounts of information in a small space. Analysts can use time event charts to help analyze, for example, larger-scale patterns of activity and relationships. (See figure A-6.)

LISTS AND TIMELINES OF KEY DATES

A-15. In many operations, including most stability operations and civil support operations, key local national holidays, historic events, and significant cultural and political events can be extremely important. Soldiers are often provided with a list of these key dates in order to identify potential dates of increased or unusual activity. These lists, however, rarely include a description of why these dates are significant and what can be expected to happen on the holiday. In some cases, days of the week themselves are significant. For example, in Bosnia weddings were often held on Fridays and celebratory fire was a common

occurrence on Friday afternoons and late into the night. Timelines—a list of significant dates along with relevant information and analysis—seek to provide a context to operational conditions. These timelines could include descriptions of population movements or political shifts that are relevant to the operational area. They could also include a brief historical record of the population or area, highlighting the activities of a certain population sector. As analytic tools, timelines might help the intelligence analyst predict how key sectors of the population might react to given circumstances.

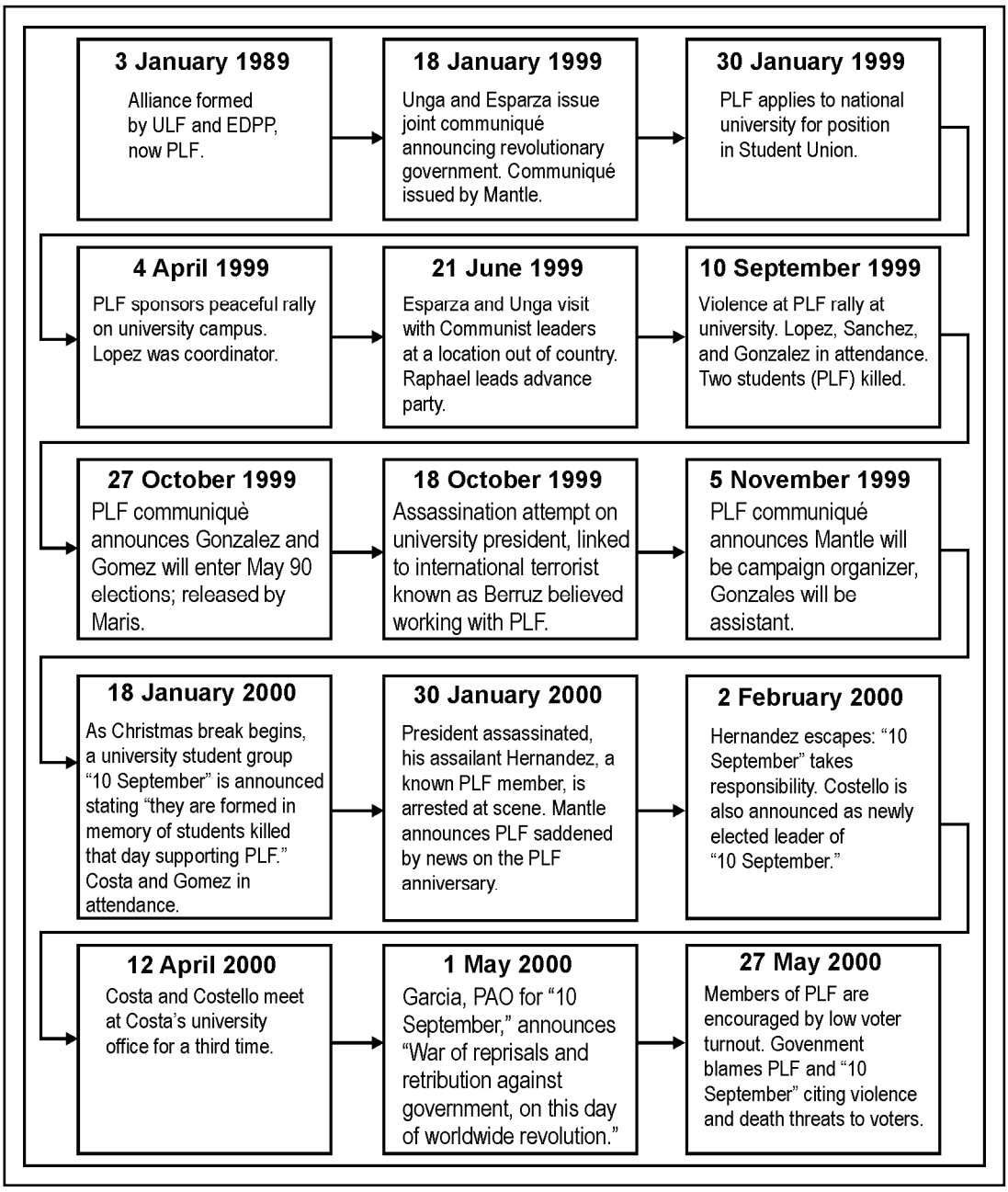

3 January 1989
Alliance formed by ULF and EDPP, now PLF.
18 January 1999
Unga and Esparza issue joint communiqué announcing revolutionary government. Communiqué issued by Mantle.
30 January 1999
PLF applies to national university for position in Student Union.
4 April 1999
PLF sponsors peaceful rally on university campus. Lopez was coordinator.
21 June 1999
Esparza and Unga visit with Communist leaders at a location out of country. Raphael leads advance party.
10 September 1999
Violence at PLF rally at university. Lopez, Sanchez, and Gonzalez in attendance. Two students (PLF) killed.
27 October 1999
PLF communiquè announces Gonzalez and Gomez will enter May 90 elections; released by Maris.
18 October 1999
Assassination attempt on university president, linked to international terrorist known as Berruz believed working with PLF.
5 November 1999
PLF communiqué announces Mantle will be campaign organizer, Gonzales will be assistant.
18 January 2000
As Christmas break begins, a university student group "10 September" is announced stating "they are formed in memory of students killed that day supporting PLF." Costa and Gomez in attendance.
30 January 2000
President assassinated, his assailant Hernandez, a known PLF member, is arrested at scene. Mantle announces PLF saddened by news on the PLF anniversary.
2 February 2000
Hernandez escapes: "10 September" takes responsibility. Costello is also announced as newly elected leader of "10 September."
12 April 2000
Costa and Costello meet at Costa's university office for a third time.
1 May 2000
Garcia, PAO for "10 September," announces "War of reprisals and retribution against government, on this day of worldwide revolution."
27 May 2000
Members of PLF are encouraged by low voter turnout. Govenment blames PLF and "10 September" citing violence and death threats to voters.

Figure A-6. Example time event chart

CULTURE DESCRIPTION OR CULTURE COMPARISON CHART OR MATRIX

A-16. In order for the intelligence analyst to avoid the common mistake of assuming that only one perspective exists, it may be helpful to clearly point out the differences between local ideology, politics, predominant religion, acceptable standards of living, norms and mores, and US norms. A culture comparison chart can be a stand-alone tool, listing just the different characteristics of the culture in question, or it can be comparative—assessing the host country population relative to known and familiar conditions.

PERCEPTION ASSESSMENT MATRIX

A-17. Perception assessment matrices are often used by PSYOP personnel and can be a valuable tool for intelligence analysts. Friendly force activities intended to be benign or benevolent might have negative results if a population's perceptions are not considered, then assessed or measured. This is true because perceptions—more than reality—drive decision making and in turn could influence the reactions of entire populations. The perception assessment matrix seeks to provide some measure of effectiveness for the unit's ability to reach an effect (for example, maintain legitimacy) during an operation. In this sense, the matrix can also be used to directly measure the effectiveness of the unit's Civil Affairs, Public Affairs, and PSYOP efforts.

A-18. One proposed PSYOP campaign developed for Operation RESTORE DEMOCRACY in Haiti illustrates why perception assessment is necessary. Prior to deployment, leaflets were published informing the Haitian populace of US intentions. The original leaflet was published in French, the language of the Haitian elite. The one actually used for the PSYOP campaign was published in Creole, the official language of Haiti, because an astute PSYOP team member realized the need to publish to the wider audience.

A-19. If the French flier had been dropped on Port-au-Prince, it could have undermined the American mission to the country in several ways. The majority of the population would have been unable to read the flier. The subsequent deployment of US forces into the country, therefore, could have been perceived to be hostile. The mission itself, which was intended in part to restore equity within the nation's social structure, could have backfired if the Haitians viewed the French flier as an indication of US favoritism to the Haitian elite.

A-20. Perception can work counter to operational objectives. Perceptions should therefore be assessed both before and throughout an operation. Although it is not possible to read the minds of the local national population, there are several means to measure its perceptions:

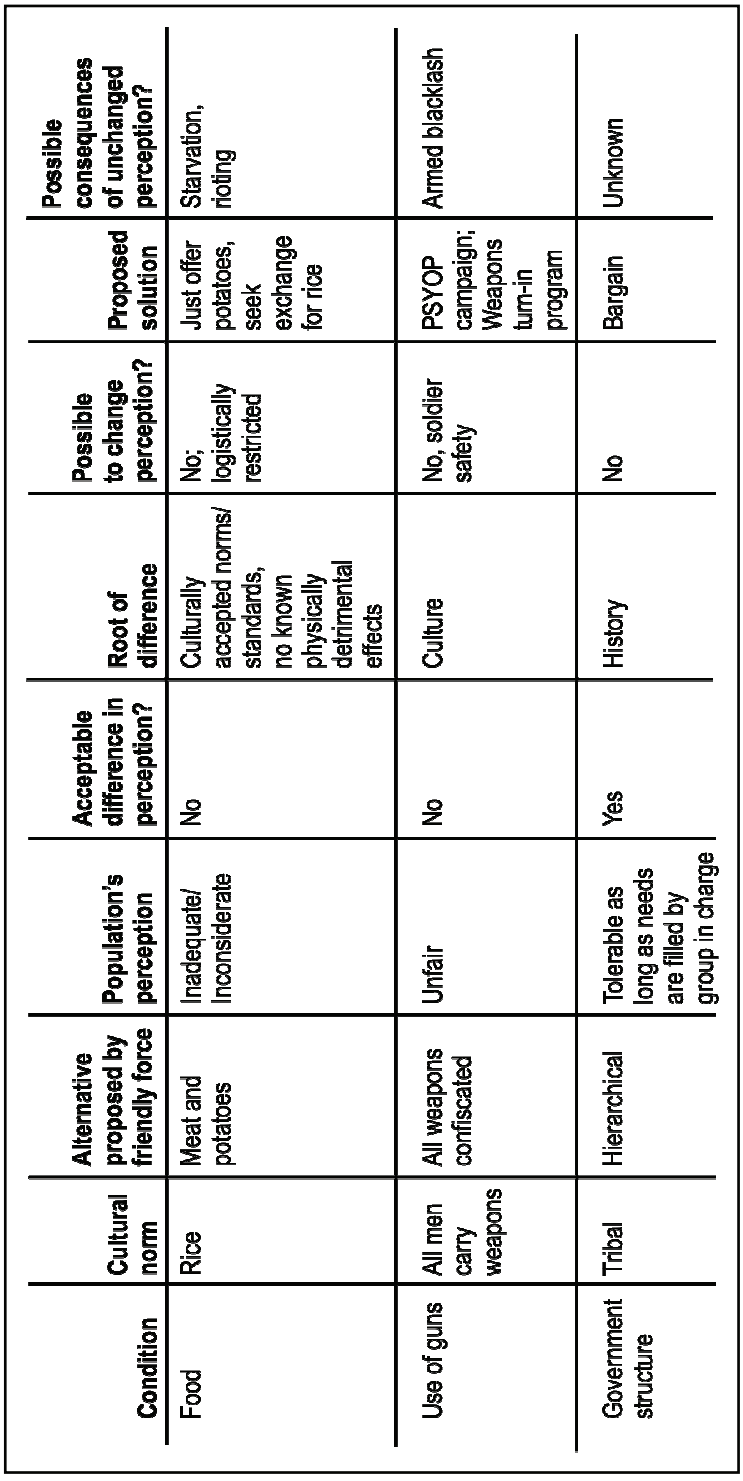
- Demographic analysis and cultural intelligence are key components of perception analysis.
- Understanding a population's history can help predict expectations and reactions.
- HUMINT can provide information on population perceptions.
- Reactions and key activities can be observed in order to decipher whether people act based on real conditions or perceived conditions.
- Editorial and opinion pieces of relevant newspapers can be monitored for changes in tone or opinion shifts that can steer or may be reacting to the opinions of a population group.

A-21. Perception assessment matrices aim to measure the disparities between friendly force actions and what population groups perceive. A sample matrix is shown in figure A-7.

A-22. In addition to trying to assess the perceptions of each population group within an operational area, it might serve the interests of the unit to assess its own perceptions of its activities. All of the following questions can begin to be addressed by the unit's scrutinizing its view of an operation:

- Are members of the unit exhibiting decidedly Western or American values that are not appreciated by the host country population?

- Are embedded American beliefs preventing the unit from understanding the host country population or its coalition partners?
- Is what the intelligence and command staff perceives really what is going on in the operational area?
- Does the population believe what the unit believes?
- Is there something that is part of the population's (or a subgroup's) perception that can be detrimental to the unit?



Condition	Cultural norm	Alternative proposed by friendly force	Population's perception	Acceptable difference in perception?	Root of difference	Possible to change perception?	Proposed solution	Possible consequences of unchanged perception?
Food	Rice	Meat and potatoes	Inadequate/ Inconsiderate	No	Culturally accepted norms/ standards, no known physically detrimental effects	No; logistically restricted	Just offer potatoes, seek exchange for rice	Starvation, rioting
Use of guns	All men carry weapons	All weapons confiscated	Unfair	No	Culture	No, soldier safety	PSYOP campaign; Weapons turn-in program	Armed blacklash
Government structure	Tribal	Hierarchical	Tolerable as long as needs are filled by group in charge	Yes	History	No	Bargain	Unknown

Figure A-7. Perception assessment matrix

Appendix A

CIVIL AFFAIRS ASSESSMENTS

A-23. As mentioned previously in Chapter 3, when deployed, Civil Affairs teams normally create an assessment of the AO to which they are assigned. These assessments can provide intelligence personnel with more detailed and more up-to-date information on the local situation. Civil Affairs teams begin initial assessments upon deployment to an AO and continuously update them throughout the duration of the mission. Table A-1 is an example outline of a Civil Affairs assessment. While the information may initially be sparse, the categories of information that the Civil Affairs teams are attempting to obtain clearly coincide with information that is of interest to intelligence staffs as well.

Table A-1. Example civil affairs assessment

I. GENERAL

A. Geography.

1. Location and size.

a. General.
b. Total land area.

2. Physical features.

a. Waterways and ports.
b. Topography.
c. Natural resources.
d. Road and rail networks.

3. Climate.

4. Political geography.

B. History.

C. People.

1. Population.

2. Culture and social structure.

a. Culture.

(1) History, government, and geography as they affect the cultural makeup of the people.

(a) Events and facts considered most important.
(b) Traditionally conducted activities, beliefs, or situations.

(2) Heroes and leaders of groups, with reasons for special esteem.

(3) Ethnic groups (racial, tribal, or religious) and population distribution (rural or urban with ratios of age, sex, and imported and exported labor forces.)

(4) Majority or minority groups (unique challenges or conditions).

(5) Moral codes.

Table A-1. Example civil affairs assessment (continued)

(6) Attitudes toward age, sex, race.

(7) Influences on personality development.

(8) Individuality.

(9) Privacy.

(10) Nature of people's perceptions.

(11) Clothing.

(12) Fatalism or self-determination.

(13) Values of economic philosophy (for example, cooperation, competition, respect for personal or private property).

b. Social structure.

(1) Status of male, female by age.

(2) Humor, entertainment.

(3) Community participation.

(4) Giving and receiving gifts.

(5) Public displays of emotion.

(6) Lines of authority.

(7) Cooperation versus competition (to include economics).

(8) The family.

(a) Roles and status of family members.
(b) Nuclear or extended.
(c) Authority, obedience, place, and expectations of members.
(d) Place in society.
(e) Inheritance customs.
(f) Entrance rites and rituals.
(g) Markers of social change, adulthood, special activities.

(9) Dating and marriage.

(a) Age standards.
(b) Influence of family and peers.
(c) Common dating practices, courtship activities.
(d) Chaperones, group dating. None.
(e) Engagement customs.
(f) Divorce, separation, aloneness.
(g) Sexual mores.

(10) Greetings.

(a) Conversation and gestures on meeting.
(b) Distinctive approaches for greetings.

Table A-1. Example civil affairs assessment (continued)

(c) Compliments given or received.
(d) Space and time (standing, sitting, distance between people).
(e) Farewell and leave talking.
(f) Use of first name versus titles.
(g) Favorite, familiar, or pleasing phrases.

(11) Visiting practices.

(a) Conversations.

1. Topics.
2. Appropriate part of visit.
3. Attitude, rate, pitch, and tone.

(b) Gifts.
(c) Compliments on possessions, family, and children.
(d) Parties and other social events.
(e) Business discussions.
(f) Mannerisms, gestures, posture, eye contact, and facial expressions.

(12) Eating practices.

(a) Table manners (before, during, and after the meal).
(b) Average diet, meal size, and scheduling.
(c) Specific foods reserved for special occasions or rituals.
(d) Forbidden foods.
(e) Social and other occasions.
(f) Unique problems and challenges.

(13) Work and recreation.

(a) Age, sex, status of hierarchy.
(b) Schedules.
(c) Obligations, successes, or failures.
(d) Business codes.
(e) Bribes.
(f) Family, cultural, social recreation, vacation, and sports.
(g) Individual recreation (with age or sex exclusions and variations).
(h) Distinctive arts and sciences.
(i) Well-known artists and athletes, others.

3. Languages.

D. United States interests.

1. US military units and teams in the area and their activities.

2. US Government organizations in the area and their interests.

3. US civilian organizations and interests in the area.

4. Legal agreements and treaties.

Table A-1. Example civil affairs assessment (continued)

5. Trade and commercial interests.

II. CIVIL DEFENSE

A. Organization.

1. Civilian or military jurisdiction.

2. Organization - rural and urban.

3. Areas of responsibility.

B. Plans.

1. Status of planning.

2. Evacuation and dispersal plans.

C. Equipment.

1. Warning and communication systems.

2. Shelter capacity, location, adequacy, and status of equipment.

3. Training facilities.

4. Rehabilitation capabilities.

D. Correlation with Other Civic Agencies (such as fire, police, medical, military).

III. LABOR

A. Organization.

1. National level.

2. Other levels.

3. Key personnel with biographical sketches.

B. Labor force.

1. Employment data and trends.

2. Available manpower and labor supply by special classes.

3. Ages and distribution.

4. Unemployment.

5. Labor productivity.

C. Agencies, institutions, and programs.

1. Government labor policy.

a. Labor laws and working conditions.

Table A-1. Example civil affairs assessment (continued)

b. Wages and other incentives.

2. Labor organizations.

a. Organizations (type, size, location, leadership, and political influence).
b. Membership.
c. Relations with foreign or international labor organizations.
d. Total potential labor force (type, distribution, mobility, and ages).

3. Social insurance.

4. Labor disputes (including mechanisms for settling).

D. Wages and standards (including hours and working conditions).

IV. LEGAL

A. System of laws.

1. Civil and criminal codes.

a. Origins.
b. Procedures.
c. Penalties.

2. Political crimes.

3. Personnel.

a. Judiciary.
b. Prosecutors.

V. PUBLIC ADMINISTRATION

A. General system of public administration.

1. Political traditions.

2. Political stability.

3. Standards and effectiveness.

4. Constitutional system.

5. Civil rights and practices.

6. Political factions, movements, and dynamics.

B. Structure of national government.

1. Executive branch.

a. Organization.
b. Powers.
c. Policies.

Table A-1. Example civil affairs assessment (continued)

d. Administration.

2. Legislative branch.

a. Organization.
b. Powers.
c. Composition of membership.
d. Pressure groups.

3. Judicial branch.

a. Organization.
b. Powers.

4. Methods of selection of key officials.

5. Biographical sketches of key officials.

C. The armed forces.

D. Political parties.

VI. PUBLIC EDUCATION

A. Agencies, institutions, and programs.

1. Government agencies and policies.

2. Educational system/facilities.

a. Administration and controls.
b. Preschool, kindergarten, and primary schools.
c. Secondary schools.
d. Vocational and special schools.
e. Higher education.
f. Teacher education.
g. Private schools.
h. Adult education.

B. Evaluation of educational system.

C. Private and public organizations.

1. Influential and pressure groups (for example, family, school, other kids, religious organizations).

2. Youth organizations.

3. Religious groups.

D. Influence of politics of education.

VII. PUBLIC FINANCE

A. Organization.

1. Municipality level.

Table A-1. Example civil affairs assessment (continued)

2. Biographical sketches of key personnel.

B. General conditions and problems. Fiscal and economic policies.

C. Monetary system. Currency.

D. Budgetary system and current budget. Current budget.

E. Sources of government income. Analysis of taxation (amount of taxes collected, method of collection, and type of taxes).

VIII. PUBLIC HEALTH

A. Organization.

1. National level.

2. Other levels.

3. Biographical sketches of key personnel.

B. General conditions and problems.

C. Agencies and institutions.

1. Hospitals.

a. Number.
b. Capacity (number of beds).
c. Location and condition of facility.

2. Other medical facilities.

a. Public.
b. Private.

D. Medical personnel.

1. Numbers (doctors and nurses).

2. Location.

3. Training.

4. Traditional medical practices (native medicine, theory of disease, and religious beliefs).

E. Medical equipment and supplies.

1. Surgical and dental equipment.

2. Testing equipment.

3. Drugs.

a. Availability.
b. Shortages.

Table A-1. Example civil affairs assessment (continued)

4. Other supplies.

F. Diseases.

1. Predominant types.

2. Control programs.

G. Environmental sanitation.

1. Regulations governing food and drugs.

2. Water control and supply.

3. Disposal of sewage and waste.

IX. PUBLIC SAFETY

A. General conditions and problems. (The primary consideration in this area is whether the existing institution [police, fire, and penal] may be used to carry out the combat commander's primary mission and to provide the day-to-day control and bodily protection of the local population.)

B. Police system.

1. Organization at all levels.

a. Types of police forces and criminal investigative agencies.
b. Organization.
c. Areas of responsibility and/or jurisdiction.
d. Chain of command.
e. Names and biographical sketches of key personnel.

2. Equipment.

a. Arms and special equipment.
b. Modern crime-fighting equipment.
c. Traffic control equipment.
d. Riot control equipment.
e. Police communications.
f. Transportation.

3. Personnel.

a. Strength
b. Method of selection.

(1) Political, racial, and religious requirements.
(2) Reliability.
(3) Moral and state of training.

c. Promotion basis.

4. Functions and authority.

a. Criminal action.
b. Civil ordinances.
c. Disorder and disaster control.

Table A-1. Example civil affairs assessment (continued)

5. Police regulations that differ from the traditional American concept of law and order.

a. General.
b. Identification system.
c. Restrictions on travel, gatherings, and curfews.
d. Restrictions on ownership of firearms.

6. Miscellaneous.

a. Other methods of enforcing law and order such as the influence of religious leaders, family ties, and role of the military.
b. Psychological effect on the local population.

X. PUBLIC WELFARE

A. Organization.

1. National level. (NA)

2. Other levels.

B. General conditions and problems.

1. Availability and sources of consumer goods and services.

2. Housing.

3. Standard of health, facilities, and supplies.

4. Major social problems.

a. Juvenile delinquency.
b. Alcohol and narcotics abuse.
c. Health problems (malnutrition and disease).
d. Unemployment.
e. Poverty and dependency.

5. Public assistance.

a. Basis upon which granted.
b. Types of relief and medical care provided.

6. Welfare services (government and private).

a. Child welfare (adoption, maternal).
b. Emergency and war relief.
c. Relief and public assistance.

XI. CIVILIAN SUPPLY

A. General conditions and problems. (Peculiarities of climate, geography, etc., which might influence civilian supply).

B. Storage, refrigeration, and processing facilities.

1. Storage space, available and required.

a. Food.
b. Other supplies

Table A-1. Example civil affairs assessment (continued)

2. Refrigeration, available and required.

a. Food.
b. Other supplies.

C. Distribution channels.

1. Food.

2. Clothing.

3. Essential durables.

D. Dietary and clothing requirements and customs.

1. Food.

a. Available.
b. Required.

2. Clothing.

a. Available.
b. Required.

3. Customs that might influence civilian supply.

E. Production excesses and shortages.

XII. ECONOMICS AND COMMERCE

A. General conditions and problems.

1. Brief coverage of natural and developed resources.

2. Self-sufficiency or dependency of the area on other sources of food, machinery, or vital minerals and supplies.

3. Extent of development and capability of railroads, canals, and the civil aviation system.

4. Development of industry, agricultural pursuits, and natural resources.

5. Developed and potential power sources.

6. Summary of important trade agreements and extent of participation in world trade.

B. Description of economic system.

1. National policy and controls.

2. Private enterprise.

3. Public enterprise.

C. Structure, key officials, and business leaders.

Table A-1. Example civil affairs assessment (continued)

D. Resources.

1. Human.

2. Natural.

E. Statistics.

1. Per capita (for example, income, savings, consumer spending).

2. Aggregate (for example, gross national product, national income, etc).

3. Ratios (for example, unemployment, productivity, occupations).

4. Validity of statistics (when compiled).

F. Goals and programs.

1. Short-range.

2. Intermediate-range.

3. Long-range.

G. Internal movement of goods.

H. Exports/Imports.

1. Type.

2. Quantity.

3. Market.

4. Influence.

I. Commerce.

1. Domestic trade.

a. Wholesale and retail distribution system.
b. Markets and fairs.
c. Weights and measures standards.
d. Cooperatives and public markets.

2. Foreign trade.

a. Principal items of exports and import.
b. Tariff system, customs, and duties.
c. Balance of payments.

J. Industries.

1. General.

Table A-1. Example civil affairs assessment (continued)

a. Location of main industrial centers.
b. Names of important companies.
c. Labor (skills and distributions).
d. Power sources and capacities.

2. Manufacturing industries.

a. Types (machinery, chemical, textile, etc).
b. Locations (province, city, etc).

3. Processing industries (types, locations, and capacities).

K. Agencies, institutions, and programs.

1. Government organization.

2. Trade associations and chambers of commerce.

3. Laws governing commerce and industry.

4. Subsidies, monopolies, etc.

L. Price control and rationing.

1. Stabilization.

2. Variation of prices.

3. Control measures and techniques.

4. Commodities under price control.5. Distribution.

a. Essential commodities.
b. Imports and exports.
c. Ration controls.
d. Production and distribution.
e. Effect on demands.
f. Types and status of markets.

6. Control systems.

a. Price control program.
b. Rationing program.
c. Raw materials.
d. Financial.

7. Legislation.

a. Price control legislation and items subject to price control.
b. Rationing legislation and items subject to rationing.

XIII. FOOD AND AGRICULTURE

A. General conditions and problems.

B. Agricultural products and processing.

Table A-1. Example civil affairs assessment (continued)

1. Livestock and dairy products (types, amounts, methods of processing, refrigeration, warehousing, etc).

2. Crops (types, amounts, methods of processing, storage, refrigeration, etc).

3. Poultry (types, amounts, methods of processing, storage, refrigeration, etc).

C. Agricultural practices.

1. Extent of mechanization.
2. Pest and disease control.

D. Land holding system and reform programs.

E. Fisheries.

1. Commercial (number, companies, location, type of fish, type of crafts, fishing areas, methods of processing, storage, annual production).

2. Private (policy, rules, regulations, type of fish, fishing areas, etc).

F. Forestry.

1. Reforestation programs.

2. Importance of forestry to the country.

H. Food production.

XIV. PROPERTY CONTROL

A. General conditions and problems.

B. Agricultural and industrial property.

XV. PUBLIC COMMUNICATIONS

A. General conditions and problems.

B. Postal system. Extent and frequency of service.

C. Radio and television.

1. Transmitting stations (number, type, and location).

2. Channels, frequencies, and trunk lines.

3. Hours of operation.

4. Censorship.

5. Propaganda usage.

Table A-1. Example civil affairs assessment (continued)

6. Foreign influence.

7. Foreign broadcasts.

8. Programming.

D. Applicable laws governing communications systems.

XVI. PUBLIC TRANSPORTATION

A. General conditions and problems.

B. Rail transport.

C. Vehicular transportation.

D. Water transportation.

1. Size, location, type, use, and ownership of all floating vessels.

2. Location of all port facilities and services.

3. Identification of sea routes.

4. Location and use of inland waterways.

E. Air transportation.

XVII. PUBLIC WORKS AND UTILITIES

A. Public utilities.

1. Power system, including nuclear reactors and power-generating plants and distribution systems.

2. Water system, including source dams, degree of pollution, filter plants, and ownership.

3. Gas works (size, location, source, and ownership).

4. Sewage collection systems and disposal plants.

5. Radioactive waste, garbage, and refuse disposal.

XVIII. ARTS, MONUMENTS, AND ARCHIVES

A. General conditions and problems.

1. Description of conditions of the arts and monuments.

2. Art advancements over the past ten years.

3. Art influence of outside countries.

B. Arts.

1. Location, type, use, and significance of the fine arts.

2. Population attitude toward art treasures.

Table A-1. Example civil affairs assessment (continued)

3. Government policies and agencies dealing with the arts.

4. Agencies through which arts are performed (government, civil agencies, etc).

C. Monuments.

1. Location of historic monuments and sites.

2. Present significance of these monuments and sites.

D. Archives.

XIX. CIVIL INFORMATION

A. Newspapers, periodicals, and publishing firms.

XX. CULTURAL AFFAIRS

A. Religions in the area.

1. National.

2. Organized.

3. Unorganized (sects).

4. Relations among religions and religious leaders, both indigenous and missionary.

B. Clergy.

1. Number, location, and education of the clergymen.

2. Influence of religious leaders.

C. Religious beliefs.

1. Major tenets of each religion, to include as a minimum, such concepts as—

a. Faith.
b. Impact of faith on life.
c. Concept of the hereafter.
d. Means of salvation.
e. Rites of cleaning and purification.
f. The impact of religion(s) on value systems.

2. Degree of religious conviction in lives of indigenous populace.

D. Worship.

1. Forms and significance of worship on each religion.

2. Places of worship.

3. Frequency of worship.

Table A-1. Example civil affairs assessment (continued)

E. Relationship between religion and motivation of local people.

F. Relationship between religion and transcultural communication.

G. Socioeconomic influence of religion.

1. Influence of religion(s) on society.

2. Economic influence of religion(s).

a. Religious ownership of property and other possessions.
b. Teachings of religion(s) about private property.

H. Interrelation with government.

1. Relationship of religious leaders and government officials.

2. Role of religion(s) and religious leaders in armed forces.

3. Political influence of religious leaders.

I. Religious schools.

1. Location, size, and attendance.

2. Influence.

3. Relationship to nonsecular schools.

XXI. DISLOCATED CIVILIANS

A. Existing dislocated civilian population (if any).

1. Existing camps.

a. Health and welfare.
b. Responsible agency (national/international).
c. Population (number, nationality).

2. Anticipated duration of need for dislocation camps.

B. Potential population dislocation.

1. Volume of dislocation by region.

2. Direction of major flow.

3. Troop support required per thousands of population.

4. US logistical support required (D-day plus 30, 60, 240).

5. Special problems.

Table A-1. Example civil affairs assessment (continued)

C. Care and control of dislocated civilians.

1. Government and private agencies involved in displaced persons and refugee activities.

a. Organization.
b. Scope and powers.
c. Relationship to international organization.
d. Emergency reserve personnel adaptable to displaced persons and refugee activities.

2. Policies and operations of area agencies handling dislocated civilians by agency (if any).

a. Policy and procedures concerning—

(1) Evacuation and control.
(2) Assembly center (or other grouping) administration.
(3) Camp or village security.
(4) Camp physical plant layout.
(5) Construction, materials, and engineering of physical plants.
(6) Health and medical care facilities.
(7) Supplies and food.
(8) Welfare services.
(9) Screening and indoctrination.
(10) Resettlement.
(11) Resources expenditure (available, used by area agencies, required by US standards.
(12) Steps needed and resources required to convert existing facilities to US standards for similar use.

b. Biographical analysis of agency personnel.

XXII. DISASTER PREPAREDNESS/RELIEF

A. Disaster preparedness (Country's history of disasters [by type]).

B. Organization.

1. Government agency responsible for disaster preparedness.

2. Government agency responsible for disaster relief operations. Public services such as—

a. Communal.
b. Health.
c. Transportation.
d. Veterinary.

3. NGOs with which prior coordination has been effected (for example, Lions Club, church groups, Rotary Club).

4. HN organizational diagram.

5. Role of the military in disaster relief.

C. Emergency procedures and relief facilities.

Table A-1. Example civil affairs assessment (continued)

1. Identified emergency centers (gyms, schools, etc).

2. Hospital surge capabilities.

3. Medical staff requirements (doctors, nurses, etc).

4. Communications systems.

D. Disaster relief.

1. Disaster relief materials and assets available.

a. Supplies and foodstuffs.
b. Materials.
c. Medicine (medical supplies).
d. Heavy equipment (construction).
e. Contractors (transportation, water storage, power generation).
f. Transportation assets (air, ground, water).
g. Mobile power generation (generators and size).
h. Labor.
i. Emergency shelters.
j. Water treatment and storage.
k. Mobile medical units and/or hospitals.

2. Emergency transportation network analysis.

a. Assumptions.

b. Roads, railways, airports, etc., that have sustained damage in previous disasters.

E. In-country POCs by position and telephone number.

1. US POCs (Embassy, US Agency for International Development, Defense Attaché Office personnel).

2. HN POCs (with telephone numbers).

PRODUCTS

A-24. When conducting operations in the urban environment, many products may be required. These products may be used individually or combined, as the mission requires. Many of the products listed in this appendix will be created in conjunction with multiple staff elements.

POPULATION STATUS OVERLAYS

A-25. Population status overlays are a group of products rather than a single product. These products depict how the population of a designated area is divided based on a single characteristic such as age, religion, ethnicity, or income. For instance, one population status overlay can show what areas of a city are Catholic, Protestant, Muslim, Hindu, and so on. Another overlay can indicate income levels or areas of known gang membership. There is no limit to the number of overlays that can be created to depict the population characteristics of a chosen area. The benefits of these overlays range from determining possible lines of contention (that can exist between groups) or identification of the population or location in greatest need of a certain activity or asset. (See figure A-8.)

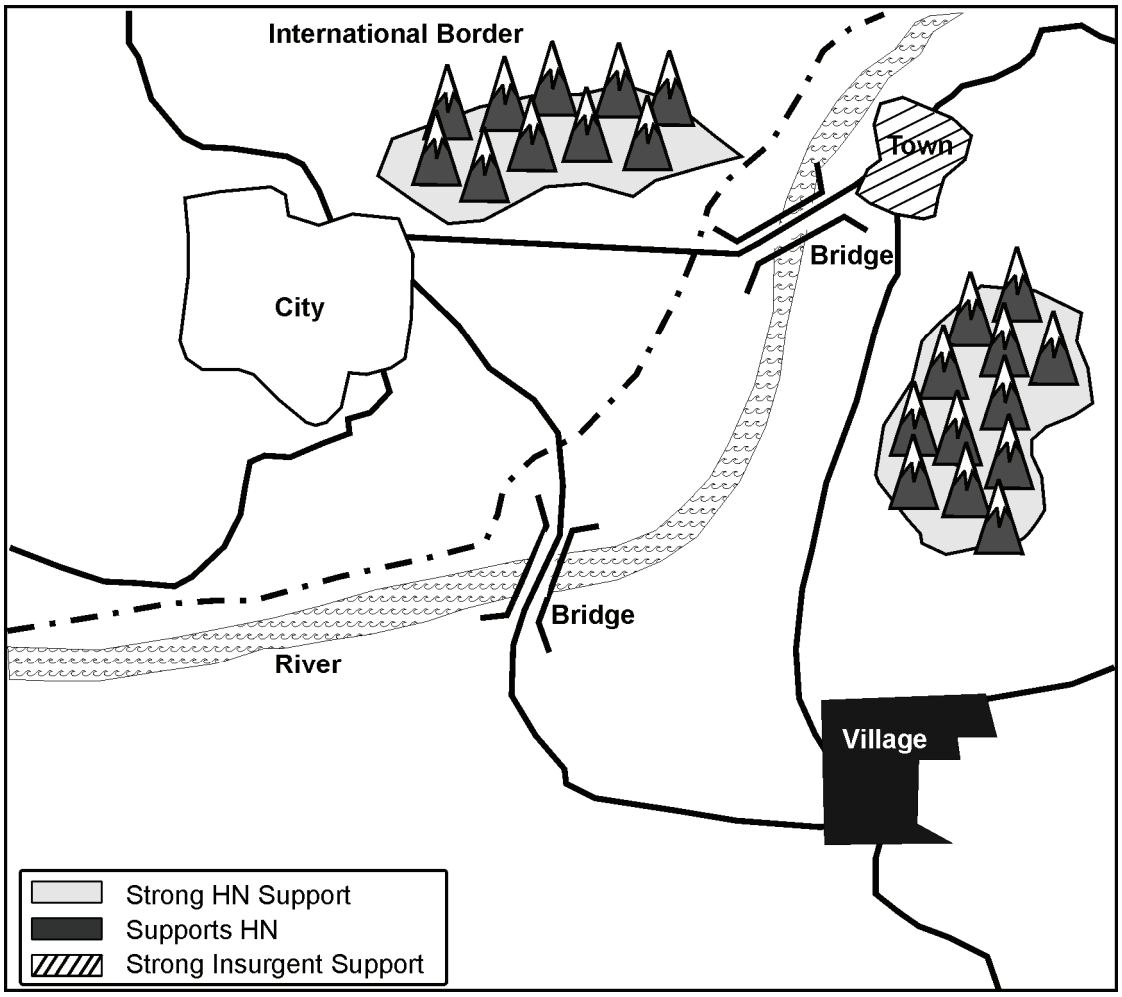


Figure A-8. Population status overlay

A-26. Many examples of this type of overlay are produced by the United Nations Office for the Coordination of Humanitarian Affairs and are readily available on its web site at http://www.reliefweb.int. Population status overlays and descriptions resulting from assessing the demographic characteristics of the host city population might reveal significant differences between groups which can further enhance situational understanding.

A-27. These overlays can be useful in identifying critical areas of the urban environment based on cultural factors such as ethnic breakdown, tribal affiliation, or religious breakdown. One common method of constructing these overlays is to color code sections of an urban area based on the majority identifications of that area. This, however, can be misleading in some situations; an alternative method that more accurately reflects the information that needs to be conveyed to the commander may be necessary. An alternative method may entail dividing the urban area into sectors (as noted in Chapter 3) using the same city divisions that local authorities such as the local police precincts or municipal districts can often help clarify the situation as well as aid in coordination efforts with the local authorities and then inserting pie charts for each sector showing each group and numbers and/or percentages.

A-28. Population dispersal can vary significantly throughout the day. Another type of population status overlay could indicate the location of population groups during the day, and how this changes over time.

This could assist in identifying possibly restrictive operating conditions or reveal times that are most conducive for completion of a given mission.

CONGREGATION POINTS OR MASS ASSEMBLY POINTS OVERLAYS

A-29. Congregation or mass assembly points overlays depict the numbers, types, and locations of sites where large numbers of people can be gathered for situations such as demonstrations, protection, feeding, in the event of a disaster. These sites may be depicted on maps of an urban area. These sites include places of religious worship, parks, schools, restaurants, squares, recreational centers, sports facilities, or entertainment centers. If normally used for large gatherings of people, these locations can also be coded with information on the population group that frequents them, days and hours of operation, and type of activity that occurs.

URBAN TERRAIN OVERLAYS

A-30. Urban terrain overlays depict specific aspects of terrain unique to the urban environment. These overlays can depict the details of a single building, a group of buildings, a section of an urban area, or even an entire urban area. This type of overlay can also depict the different terrain zones apparent in an urban area. Different types of terrain could be indicated using hatch marks or other indicators on a map or aerial photograph. Zone types may be defined as close, orderly block, or dense random construction (as they are in FM 3-06), or by any other designated characteristics required by the mission, such as zones of threat occupation or zones divided by the types of predicted weapons effects.

A-31. A building type overlay can depict particular types of buildings, such as industrial buildings, government buildings, military buildings, residential areas, businesses, warehouses or storage buildings, religious centers, or media locations. Each of the buildings can be numbered or otherwise identified depending on the needs of the commander and his staff. Additionally, entire sections of a city can be marked depending on the construction type prevalent in a particular area. For instance, an area of dense construction or a shantytown can be identified by appropriately labeling it on an overlay or directly onto an aerial photograph.

A-32. Shantytowns may need to be specifically highlighted because they may be areas with notable food shortages and where disease and pollution are most prevalent. Shantytowns may lack public utility infrastructure (for example, plumbing and electricity). Buildings are often made from miscellaneous materials, and there is no consistent pattern of streets or corridors, complicating military operations. These types of conditions result in a concentration of population that is generally dissatisfied and is a potential source of unrest.

A-33. Unoccupied locations or buildings should also be identified. These locations or buildings can be used as shelter for troops (friendly or threat) or as locations for friendly forces to demonstrate firepower if necessary. The latter utility was demonstrated in Kosovo when a tank round was shot into an unoccupied building in order to quell an increasingly worrisome civil disturbance. Additionally, unoccupied locations or buildings could be logistics storage sites or meeting sites for threat forces.

A-34. An overlay depicting street widths in terms of major weapon systems can help identify which formations or routes are most advisable for an area. A street wide enough to allow two Abrams tanks to advance side by side enables the vehicles to better cover upper floors on opposite sides of the street, thereby providing security for each other. Also, depicting buildings that exceed the depression or elevation capabilities of vehicle weapons systems can identify areas of concern and potential enemy ambush positions. Routes with such “dead spaces” may require convoys with additional or alternative weapons systems able to eliminate this vulnerability.

A-35. Three urban terrain related products that are used primarily in air operations are the roof coverage overlay, the vertical and lateral references urban terrain feature overlay (UTFO), and the urban terrain orientation graphic (UTOG). (See FM 3-06.1.) In urban terrain, roof coverage is more meaningful to

aviation operations than a ground-based horizontal visibility (fields of fire) analysis. The roof coverage overlay depicts concealment from aerial observation and directly relates to the density of structures. (See figure A-9.)

A-36. The vertical and lateral reference UTFO is used to prepare aircrews for aviation urban operations. It annotates prominent navigation features as points (vertical structures), lines (lateral references), or areas. The altitude in feet above mean sea level (MSL) and, in parentheses, height above ground level (AGL); for example, "1,460 feet (940 feet), follows vertical features. Elevation data, both MSL and AGL, are important for mission planning. This overlay may be combined with the UTOG detailed below. The UTFO identifies and plots:

- Dominant vertical features.
- Significant linear features.
- Prominent, unique structures.
- Currently known deliberate hazards or helicopter countermeasures.

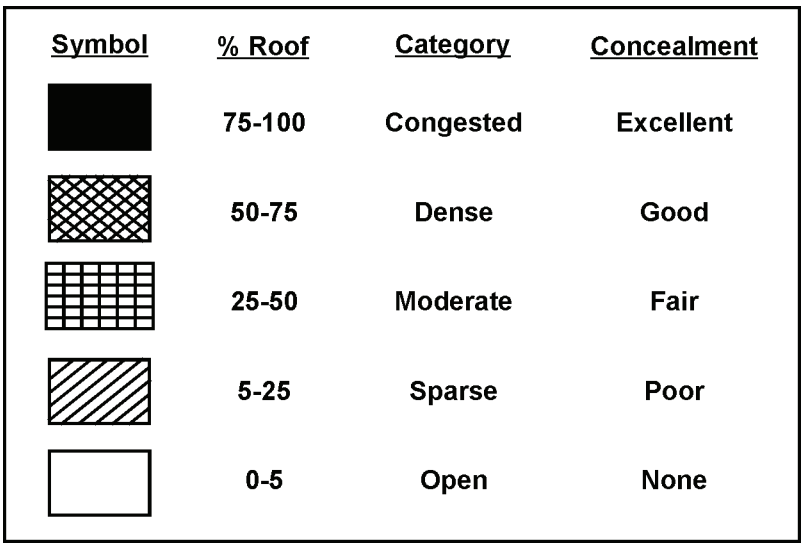


Figure A-9. Example roof cover overlay

A-37. The UTOG overlay is used for aircrew orientation. A graphical depiction of urban terrain characteristics allows a more thorough orientation than map reconnaissance alone. The UTOG is prepared by dividing the terrain into areas classified by density of structures and building construction. Digital Feature Analysis Data (DFAD) codes may be used on overlay products to minimize clutter. This product serves as a substitute for the traditional combined obstacle overlay for aviation operations and may be combined with the UTFO. (See figure A-10.) The UTOG provides the following urban area general characteristics:

- Density of structures.
- Building construction.
- Street pattern.

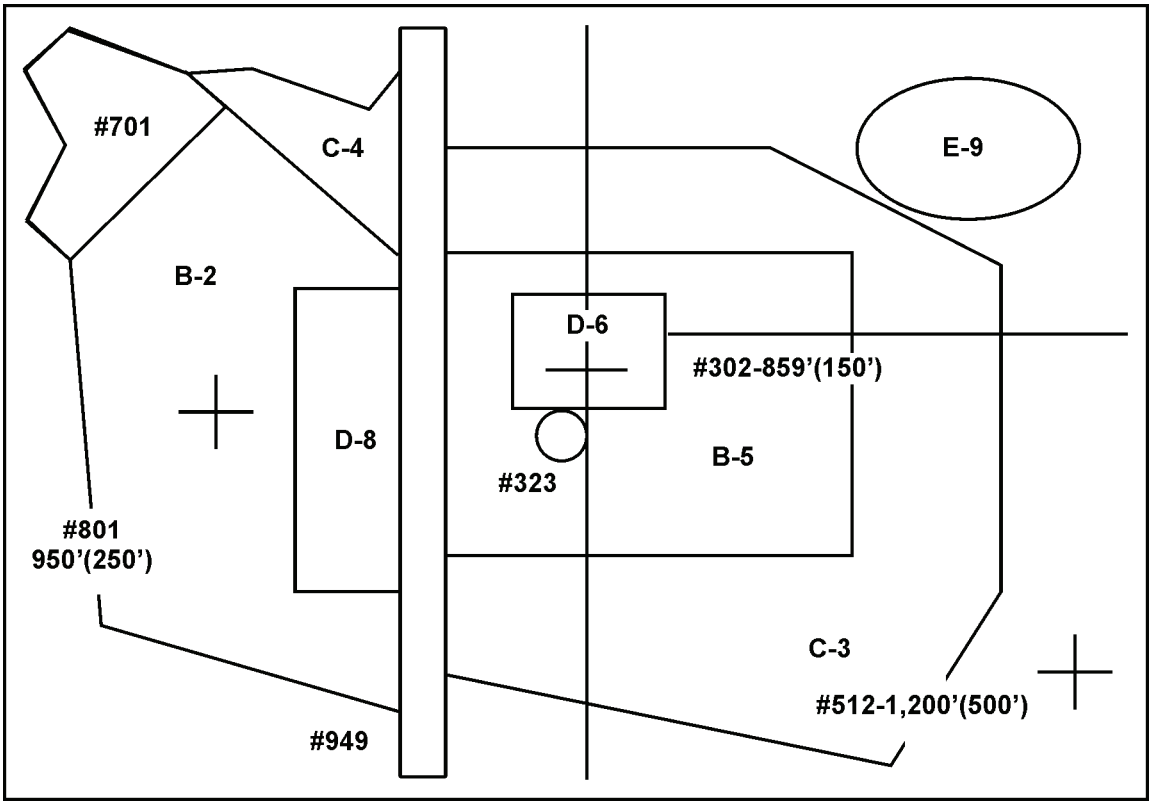


Figure A-10. Combined UTOG/UTFO (simplified example)

LINES OF COMMUNICATION OVERLAYS

A-38. LOC overlays identify the major LOCs within and around an urban area. This includes roads, airfields, waterways, railroads, and foot paths. More advanced versions of these overlays can be combined with the traffic conditions overlay and long-term surveillance of LOCs to determine what LOCs are most heavily traveled at different times of the day. Threat forces can take advantage of higher volumes of civilian traffic to use these LOCs for their own purposes.

A-39. These overlays can provide mobility information to assist planners and operators in determining what equipment can move along the city's mobility corridors. Pertinent data would include street widths, their load capacity, sharp turns, potential ambush positions, potential sniper positions, and overhanging obstacles.

A-40. Even though aerial surveillance can detect heavy traffic and traffic jams, it cannot predict when or why they occur or whether or not they were part of the normal traffic pattern in the urban area. Creating an LOC overlay that depicts normal traffic conditions can help the unit determine best times to operate. It can also provide an indicator of an unusual event.

A-41. Waterways can play a significant role in the urban terrain. Among other things, they can be obstacles or LOCs for illicit traffic (arms smuggling, drug smuggling, black marketeering). An overlay of local water systems can list such important items as the width and depth of the waterway, key crossing sites (depending on the size of the waterway), and key uses of that waterway (such as commerce, water source for crops, drinking water source for the local population).

LINE OF SIGHT OVERLAYS

A-42. Perhaps even more important in the complex urban environment than in non-complex terrain, line-of-sight overlays can help define AAs to an objective. Just as important are reverse line-of-sight overlays that show the friendly AAs from the enemy standpoint. We can expect the enemy to try to cover dead space from the objective area with other positions or devices such as mines or IEDs. If the enemy on the objective simply wants to flee, dead spaces may simply be covered by some type of early warning system.

A-43. Line-of-sight overlays can help pinpoint potential sniper positions along each relevant AA based on the best possible locations given line of sight, elevation, exposure, and other pertinent considerations. These positions are important because friendly forces can position personnel at these locations to secure them or observe from them as readily as threat forces.

KEY INFRASTRUCTURE OVERLAYS

A-44. These overlays depict the locations of key infrastructure in an urban environment. Like population status overlays, this type of overlay is a group of products rather than a single product. These overlays can be produced by using a map, aerial photography, or graphic design that is appropriately marked with a numbering or a color-coded system that indicates the type of asset as well as its specific attributes.

A-45. Key infrastructure required to sustain a city can be used as a tool of warfare both in the physical and information domains. Securing key infrastructure from destruction will often be key to gaining and maintaining a positive perception of friendly forces by the local populace. The most important part of the key infrastructure is the critical infrastructure. This may include electricity generation plants, hydroelectric dams, pumping stations, water purification plants, sewage treatment plants, and anything that, if harmed, can affect the living conditions of the population.

A-46. Key infrastructure overlays can be useful for identifying protected urban terrain. Protected terrain encompasses areas that should not be destroyed, attacked, or occupied, or that have other use restrictions based on international treaties, ROE, and common sense—such as schools, hospitals, areas with large amounts of phone and/or electrical wiring, and buildings with many stories. For example, medical facilities may be depicted on their own key infrastructure overlay. Medical facilities are generally NFAs for friendly forces and should be protected from damage or destruction so that they can continue to take care of the local population once friendly forces have secured the urban area. Inadequate health care for the local population can lead to both a negative perception of friendly forces and an uncontrolled increase in disease which can affect friendly forces personnel working in the urban environment directly.

A-47. Other types of key infrastructure overlays may depict media facilities, transportation facilities, resource sites, culturally significant structures, dangerous facilities or subterranean infrastructure. Media facilities include locations of transmission stations, antennas, newspaper production and distribution sites, and television and radio stations. Transportation facilities include rail hubs, major bus connection sites, subway lines, freeways, major thoroughfares, and intersections that are significant to the operation. A resource sites key infrastructure overlay can depict locations where resources or supplies can be obtained, such as building material locations, car lots, and appliance warehouses. This can include petroleum and natural gas processing plants. Generally, these are the resources and infrastructure that are used to support the critical resource needs of a population.

A-48. A key infrastructure overlay could highlight culturally significant structures such as places of religious worship (for example, churches, temples, mosques), all relevant government buildings and internationally significant buildings (for example, embassies and consulates), and other structures or areas of notable cultural importance. A key infrastructure overlay of dangerous facilities could depict structures with known chemical, biological, or incendiary features. These are primarily TIM sites, such as pharmaceutical plants, oil refineries, or fertilizer plants, but can include military-related areas like ammunition storage sites. Finally, an overlay depicting key subterranean infrastructure can include

underground railways, sewer systems, electrical wiring, or any other underground feature of significance for the operation.

URBAN MODELS

A-49. Operations within the urban environment follow standard Army doctrine regarding the wargaming process. Because of the level of detail, however, there is a need for a modeling tool. These tools can range from plastic or wooden models to overhead images to sand tables. Probably the best is the combination of overhead imagery and 3D models. Figure A-11 is an example of the imagery and urban models. It reflects the Shugart-Gordon Urban training site at Fort Polk, LA, and includes an aerial imagery and a 3D Model with a multiple perspective view. These products should be used together.

IMAGERY

A-50. Analysis of any urban environment would be incomplete without the use of imagery. Imagery products for the urban environment include both aerial photography and satellite imagery. In many cases, tasked aerial reconnaissance platforms, such as UASs, respond directly to the commander, thus ensuring timely and focused data collection. Because of technical limitations or priorities established at the higher echelons, space-based and other national collection assets may not be available to the commander and staff. Additionally, as each collection system has its own unique capabilities, traditional black and white or infrared imagery may offer the best view of the target in a given situation.

Figure A-11. Example of imagery and urban models

A-51. A key element in future urban operations may be the real-time imagery downlink capabilities of space-based intelligence collection platforms. Employing state-of-the-art multispectral, infrared, EO imagery, and synthetic aperture radar (SAR) imaging, space-based systems can provide important information in the urban environment. Data collected from such sources is transferred in digital format, which then can be manipulated to address specific requirements. Intelligence staffs must be fully aware of the capabilities and limitations of these systems as well as the procedures necessary to request this support.

A-52. Advanced geospatial intelligence products are produced using any combination of imaging platforms: visible, infrared, radar, or spectral depending on the requestor's needs. Due to the versatility of these products, they have a wide range of applications in the urban environment. Presenting imagery in an oblique perspective by combining it with digital terrain elevation data provides a perspective view. Using spectral imagery can accomplish discovery and identification of manmade and indigenous activity from patterns of heat distribution and determination of changes in a scene imaged at various times. Other uses include facility analysis, structural analysis, target detection, soil analysis, and damage assessment.

Appendix B

Non-US Small Arms and Light Weapons Effects in the Urban Environment

B-1. The US Army Materiel Systems Analysis Activity provided the data in this appendix to use as a reference for planning and training. The charts were compiled to assess a variety of threat (non-US) weapons against many structures or materials found in an urban environment. This assessment was based on a review of limited test data, comparisons to US weapons data against urban structures and materials, subject matter expertise, and professional military judgment.

B-2. There are seven tables. The acronym list and Note at the end of this appendix pertain to these tables.

Appendix B

Table B-1. Rifles, machine, and submachine guns

		Target and Thickness							
Model #	Round/Bullet	Reinforced Concrete	Triple Brick Wall	Concrete Block w/Single Brick Veneer	Cinder Block (Filled)	Double Brick Wall	Double Sandbag Wall	Log Wall	Mild Steel Door
		8"	14"	12"	12"	9"	24"	16"	3/8"
AK-74 RPK74	5.45-mm Ball	○	○	○	○	○	○	◐	●
	Ball Tracer	○	○	○	○	○	○	◐	●
	Incendiary-T	○	○	○	○	○	○	◐	●
	Armor Piercing (AP)	○	○	○	○	○	○	◐	●
AK-47	7.62-mm Ball	○	○	○	◐	○	○	●	●
	Tracer	○	○	○	◐	○	○	●	●
	API	○	○	○	◐	○	○	●	●
	Tracer Incendiary	○	○	○	◐	○	○	●	●
RPD/RPK	7.62-mm Ball	○	◐	○	◐	○	○	●	●
	Tracer	○	◐	○	◐	○	○	●	●
	API	○	◐	○	◐	○	○	●	●
	Tracer Incendiary	○	◐	○	◐	○	○	●	●
SKS	7.62-mm Ball	○	◐	○	◐	○	○	●	●
	Tracer	○	◐	○	◐	○	○	●	●
	API	○	◐	○	◐	○	○	●	●
Mosin-Nagant SVD	7.62-mm Light Ball	○	○	○	◐	○	○	●	●
	Heavy Ball	○	○	○	◐	○	○	●	●
	Sniper	○	○	○	◐	○	○	●	●
	Enhanced Penetration	○	◐	○	◐	◐	○	●	●
	API	○	◐	◐	◐	◐	○	●	●
	Tracer	○	◐	○	◐	○	○	●	●
PKM MG SVD	7.62-mm Ball	○	○	○	○	○	○	●	●
	Ball-Tracer	○	○	○	◐	○	○	●	●
	Incendiary-ranging	○	○	○	○	○	○	●	●
	API	○	○	○	◐	○	○	●	●
	API-T	○	○	○	◐	○	○	●	●
NSV/NSV-T	12.7-mm API (B-32)	○	◐	◐	◐	◐	○	●	●
	API-T (BZT-44)	○	◐	◐	◐	◐	○	●	●
	HEI	○	◐	◐	◐	◐	○	●	●
DshK	12.7-mm Ball	○	◐	◐	◐	◐	○	●	●
	API (B-32)	○	◐	◐	◐	◐	○	●	●
	API-T (BZT-44)	○	◐	◐	◐	◐	○	●	●

Legend

○ A combatant can fight, using applicable tactics, techniques, and procedures, from a position protected by this barrier without need to seek greater ballistic protection.

◐ A combatant can fight, using applicable tactics, techniques, and procedures, from a position protected by this barrier for a limited time due to the barrier's vulnerability to projectile penetration.

● A combatant would select this barrier as a last resort for protection.

- No Munitions will clear re-bar
- Sniper munitions = improvement of accuracy
- Worst case scenario = Perpendicular contact with CMU
- Tracer = Normal Blast Munitions

Table B-2. Grenade launchers

		Target and Thickness							
Model #	Round	Reinforced Concrete	Triple Black Wall	Concrete Block w/ Single Brick Veneer	Cinder Block (Filled)	Double Brick Wall	Double Sandbag Wall	Log Wall	Mild Steel Door
		8"	14"	12"	12"	9"	24"	16"	3/8"
AGS-17	30-mm FRAG-HE Grenade	○	◉	○	◉	◉	○	◉	●
W-87 (Chinese)	35-mm FRAG-HE Grenade	○	◉	○	◉	◉	◉	◉	●
	HEAT Grenade	◉	◉	●	●	●	●	●	●
GP-30	40-mm FRAG-HE (Impact) Grenade	○	◉	○	◉	◉	◉	◉	●
	FRAG-HE (Bounding) Grenade	○	◉	○	◉	◉	◉	◉	●
	Smoke Grenade	○	○	○	○	○	○	○	○
RPO (A/Z)	Napalm Projectile	●	●	●	●	●	●	●	●
	Thermobaric-flammable Mixture Projectile	●	●	●	●	●	●	●	●
	Incendiary	●	●	●	●	●	●	●	●
SPG-9M Recoilless Gun	73-mm RA HEAT	●	●	●	●	●	●	●	●
	RA HE	●	●	●	●	●	●	●	●
	FRAG-HE (Bounding) Grenade	●	●	●	●	●	●	●	●

Legend

○ A combatant can fight, using applicable tactics, techniques, and procedures, from a position protected by this barrier without need to seek greater ballistic protection.

◉ A combatant can fight, using applicable tactics, techniques, and procedures, from a position protected by this barrier for a limited time due to the barrier's vulnerability to projectile penetration.

● A combatant would select this barrier as a last resort for protection.

Table B-3. Antitank guided missiles

		Target and Thickness							
Model #	Round	Reinforced Concrete	Triple Brick Wall	Concrete Block w/ Single Brick Veneer	Cinder Block (Filled)	Double Brick Wall	Double Sandbag Wall	Log Wall	Mild Steel Door
		8”	14”	12”	12”	9”	24”	16”	3/8”
AT-3	ATGM (Shaped charge HEAT)	●	●	●	●	●	●	●	●
	Malyutka (tandem shaped charge HEAT)	●	●	●	●	●	●	●	●
AT-4/AT-5	ATGM (Shaped charge HEAT)	●	●	●	●	●	●	●	●
	Tandem Shaped charge HEAT	●	●	●	●	●	●	●	●
AT-7	ATGM (Shaped charge HEAT)	●	●	●	●	●	●	●	●
AT-10	ATGM	●	●	●	●	●	●	●	●
AT-11	ATGM (Shaped charge HEAT)	●	●	●	●	●	●	●	●
	Tandem Shaped charge Heat	●	●	●	●	●	●	●	●
AT-13	ATGM (Tanderm Shaped charge HEAT)	●	●	●	●	●	●	●	●
	HE Thermobaric (Metis-M)	●	●	●	●	●	●	●	●
AT-14 KORNEL	ATGM (Tandem Shaped charge HEAT)	●	●	●	●	●	●	●	●
	HE Thermobaric	●	●	●	●	●	●	●	●
HOT/HOT2/ HOT3	ATGM (Shaped charge HEAT)	●	●	●	●	●	●	●	●
	Tandem shaped charge Heat	●	●	●	●	●	●	●	●

Legend

○ A combatant can fight, using applicable tactics, techniques, and procedures, from a position protected by this barrier without need to seek greater ballistic protection.

◍ A combatant can fight, using applicable tactics, techniques, and procedures, from a position protected by this barrier for a limited time due to the barrier’s vulnerability to projectile penetration.

● A combatant would select this barrier as a last resort for protection.

Table B-4. Antitank grenade launchers (RPGs)

		Target and Thickness							
Model #	Round	Reinforced Concrete	Triple Brick Wall	Concrete Block w/ Single Brick Veneer	Cinder Block (Filled)	Double Brick Wall	Double Sandbag Wall	Log Wall	Mild Steel Door
		8”	14”	12”	12”	9”	24”	16”	3/8”
RPG-7V	40-mm PG-7V Grenade	●	●	●	●	●	●	●	●
	PG-7VM Grenade	●	●	●	●	●	●	●	●
	PG-7VS Grenade	●	●	●	●	●	●	●	●
	PG-7VL Grenade	●	●	●	●	●	●	●	●
	PG-7VR Grenade	●	●	●	●	●	●	●	●
	TBG-7V Grenade	●	●	●	●	●	●	●	●
	OG-7V Grenade	●	●	●	●	●	●	●	●
	OG-7VM Grenade	●	●	●	●	●	●	●	●
RPG-22	72-mm HEAT Grenade	●	●	●	●	●	●	●	●
RPG-29	105-mm HEAT (Tandem) Grenade	●	●	●	●	●	●	●	●

Legend

○ A combatant can fight, using applicable tactics, techniques, and procedures, from a position protected by this barrier without need to seek greater ballistic protection.

◍ A combatant can fight, using applicable tactics, techniques, and procedures, from a position protected by this barrier for a limited time due to the barrier’s vulnerability to projectile penetration.

● A combatant would select this barrier as a last resort for protection.

- No Munitions will clear re-bar before penetration occurs
- Will create loophole (8 inch in diameter)

Table B-5. Artillery

Model #	Round	Target and Thickness: Reinforced Concrete	Triple Brick Wall	Concrete Block w/ Single Brick Veneer	Cinder Block (Filled)	Double Brick Wall	Double Sandbag Wall	Log Wall	Mild Steel Door
		8"	14"	12"	12"	9"	24"	16"	3/8"
ZIS-3 (Towed AT Gun)	76-mm HVAP-T	●	●	●	●	●	●	●	●
	HEAT	●	●	●	●	●	●	●	●
	APC-T	●	●	●	●	●	●	●	●
	FRAG-HE	●	●	●	●	●	●	●	●
D-44 (Towed AT Gun)	85-mm HVAP-T	●	●	●	●	●	●	●	●
	HEAT-FS	●	●	●	●	●	●	●	●
	AT-HE	●	●	●	●	●	●	●	●
	FRAG-HE	●	●	●	●	●	●	●	●
	Smoke	○	○	○	○	○	○	○	○
MT-12 (Towed AT Gun)	100-mm APFSDS-T	●	●	●	●	●	●	●	●
	HEAT	●	●	●	●	●	●	●	●
	FRAG-HE	●	●	●	●	●	●	●	●
2A45M (Towed AT Gun)	123-mm APFSDS-T	●	●	●	●	●	●	●	●
	HEAT	●	●	●	●	●	●	●	●
	Frag-HE	●	●	●	●	●	●	●	●

Legend

○ A combatant can fight, using applicable tactics, techniques, and procedures, from a position protected by this barrier without need to seek greater ballistic protection.

◍ A combatant can fight, using applicable tactics, techniques, and procedures, from a position protected by this barrier for a limited time due to the barrier's vulnerability to projectile penetration.

● A combatant would select this barrier as a last resort for protection.

Table B-6. Antiaircraft

Model #	Round/Bullet	Target and Thickness: Reinforced Concrete	Triple Brick Wall	Concrete Block w/ Single Brick Veneer	Cinder Block (Filled)	Double Brick Wall	Double Sandbag Wall	Log Wall	Mild Steel Door
		8”	14”	12”	12”	9”	24”	16”	3/8”
S-60 (Towed AA)	57-mm FRAG-T	●	●	●	●	●	●	●	●
	APT	●	●	●	●	●	●	●	●
ZPU-4	14.5-mm AP-T	●	●	●	●	●	●	●	●
	API	●	●	●	●	●	●	●	●
	API-T	●	●	●	●	●	●	●	●
	HEI	●	●	●	●	●	●	●	●
	HEI-T	●	●	●	●	●	●	●	●
ZU-23	23-mm HE-I	●	●	●	●	●	●	●	●
	HEI-T	●	●	●	●	●	●	●	●
	API-T	●	●	●	●	●	●	●	●
	TP	●	●	●	●	●	●	●	●

Legend

○ A combatant can fight, using applicable tactics, techniques, and procedures, from a position protected by this barrier without need to seek greater ballistic protection.

◉ A combatant can fight, using applicable tactics, techniques, and procedures, from a position protected by this barrier for a limited time due to the barrier’s vulnerability to projectile penetration.

● A combatant would select this barrier as a last resort for protection.

Table B-7. Weapons systems on helicopters

	Target and Thickness								
Model #	Round/Bullet	Reinforced Concrete	Triple Brick Wall	Concrete Block w/Single Brick Veneer	Cinder Block (Filled)	Double Brick Wall	Double Sandbag Wall	Log Wall	Mild Steel Door
		8"	14"	12"	12"	9"	24"	16"	3/8"
AT-2C	ATGM	●	●	●	●	●	●	●	●
AT-6C	ATGM (Tandem HEAT)	●	●	●	●	●	●	●	●
AT-9	ATGM (Tandem HEAT)	●	●	●	●	●	●	●	●
AT-16/VIKhR	ATGM	●	●	●	●	●	●	●	●
12.7-mm gun/ YaKb-12.7	HEFI	○	◐	◐	◐	◐	○	●	●
	APT	○	◐	◐	◐	◐	○	●	●
	Duplex	○	◐	◐	◐	◐	○	●	●
	Duplex T	○	◐	◐	◐	◐	○	●	●
GSh-23L/ 23-mm Gun Pods	HE	●	●	●	●	●	●	●	●
	AP	●	●	●	●	●	●	●	●
GSh-30L/ 30-mm Gun Pods	HEFI	●	●	●	●	●	●	●	●
	HEI	●	●	●	●	●	●	●	●
	APT	●	●	●	●	●	●	●	●
	APE	●	●	●	●	●	●	●	●
	CC	●	●	●	●	●	●	●	●
2A42/30-mm Auto Cannon	HE	●	●	●	●	●	●	●	●
	AP	●	●	●	●	●	●	●	●
57-mm S-5 Rocket Pods	HE	●	●	●	●	●	●	●	●
	AP	●	●	●	●	●	●	●	●
80-mm S-8 Rocket Pods	HE	●	●	●	●	●	●	●	●
	AP	●	●	●	●	●	●	●	●

Legend

○ A combatant can fight, using applicable tactics, techniques, and procedures, from a position protected by this barrier without need to seek greater ballistic protection.

◐ A combatant can fight, using applicable tactics, techniques, and procedures, from a position protected by this barrier for a limited time due to the barrier's vulnerability to projectile penetration.

● A combatant would select this barrier as a last resort for protection.

The CC round listed for the GSh-30L/30-mm gun pods is a cargo-carrier round. It contains small pellets (about 3.5g each) that are dispersed from a projectile by a fuze. The energy of each of these pellets is similar to that of a 5.56-mm bullet. The pellets alone are probably capable of perforating the steel door listed in the charts and could chew up sandbag walls.

Table B-8. Acronyms used in the tables

AP	Armor Piercing
APE	Armor Piercing Explosive
APFSDS-T	Armor Piercing, Fin Stabilized, Discarding Sabot-Tracer
API	Armor Piercing Incendiary
API-T	Armor Piercing Incendiary-Tracer
ATGM	Anti Tank Guided Missile
AT-HE	Anti Tank-High Explosive
CC	Cargo Carrier
CMU	Concrete Modular Unit
Duplex T	Duplex Tracer
FRAG	Fragmentation
FRAG-HE	Fragmentation-High Explosive
HE	High Explosive
HEFI	High Explosive Fragmentation Incendiary
HEI	High Explosive Incendiary
HEI-T	High Explosive Incendiary-Tracer
HEAT	High Explosive Anti Tank
HEAT-FS	High Explosive Anti Tank-Fin Stabilized
HVAP-T	Hypervelocity Armor Piercing-Tracer
Incendiary-T	Incendiary-Tracer
RA	Reactive Armor
RPG	Rocket Propelled Grenade
TP	Target Practice

Note. The CMU used in the worst case scenario is a cinderblock filled with concrete and reinforced with one-half inch rebar placed at 8- to 10-inch intervals. The limited test data that is available is primarily focused on perpendicular engagements. Engagements at reasonable oblique angles (less than 45 degrees) would have the biggest impact on small arms, probably some limited impact on medium caliber AP rounds and no impact on large caliber rounds, missiles, or RPGs.

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Glossary

The glossary lists acronyms and terms with Army or joint definitions, and other selected terms. Where Army and joint definitions are different, (Army) follows the term. Terms for which FM 2-0 is the proponent FM (authority) are marked with an asterisk (*) and followed by the number of the paragraph (¶) where they are discussed. For other terms, the number of the proponent FM follows the definition. JP 1-02 and FM 1-02 are posted in the Joint Electronic Library, which is available online and on CD-ROM.

SECTION I – ACRONYMS AND ABBREVIATIONS

3D	three dimensional
AA	avenue of approach
AC	Active Component
ACE	Analysis Control Element
ACT	Analysis Control Team
ADA	air defense artillery
AFMIC	Armed Forces Medical Intelligence Center
AGL	above ground level
AIDS	acquired immune deficiency syndrome
AKO	Army Knowledge Online
AMD	air and missile defense
AO	area of operation
AOI	area of interest
ASCOPE	areas, structures, capabilities, organization, people, and events
BDE	brigade
BN	battalion
C2	command and control
CAT	category
CBRN	chemical, biological, radiological, nuclear
CED	captured enemy document
CI	counterintelligence
CICA	Counterintelligence Coordinating Authority
CNA	computer network attack
CNO	computer network operations
COA	course of action
COG	center of gravity
C-SIGINT	counter-signals intelligence
CSP	contingency support package
CSS	contingency support study
DA-IIS	Department of the Army Intelligence Information Service
DF	direction finding
DFAD	Digital Feature Analysis Data

DHA	detainee holding area
DIA	Defense Intelligence Agency
DMZ	demilitarized zone
DNA	Deoxyribonucleic Acid
DOD	Department of Defense
DOCEX	document exploitation
DTED	digital terrain evaluation data
DTG	date-time group
EEI	Essential Elements of Information
EM	electromagnetic
EO	electro-optical
EOD	explosive ordnance disposal
EPW	enemy prisoner of war
etc	and so forth
EW	electronic warfare
FID	Foreign Internal Defense
FLIR	forward-looking infrared
FM	frequency modulation
FP	force protection
GEOINT	geospatial intelligence
GPS	global positioning system
GRG	gridded reference graphic
HAT	HUMINT Analysis Team
HCT	human intelligence collection team
HOC	HUMINT Operations Cell
HIV	human immunodeficiency virus
HLZ	helicopter landing zone
HN	host nation
HUMINT	human intelligence
ICL	intelligence coordination line
IDF	Israel Defense Force
IED	improvised explosive device
IMINT	imagery intelligence
INTELINK	intelligence link
IO	information operations
IPB	intelligence preparation of the battlefield
ISR	intelligence, surveillance, and reconnaissance
JTF	joint task force
JSTARS	Joint Surveillance Target Attack Radar System

JWICS	Joint Worldwide Intelligence Communications System
LANDSAT	land satellite
LOB	line of bearing
LOC	line of communication
LZ	landing zone
MANPADS	Manportable Air Defense Systems
MASINT	measurement and signature intelligence
MDMP	military decision-making process
METT-TC	mission, enemy, terrain and weather, troops and support available, time available, and civil considerations
MGRS	Military Grid Reference System
MI	Military Intelligence
MSL	mean sea level
NA	not applicable
NAI	named area of interest
NATO	North Atlantic Treaty Organization
NFA	no-fire area
NGA	National Geospatial-Intelligence Agency
NGIC	National Ground Intelligence Center
NGO	nongovernmental organization
NISH	NEO intelligence support handbook
NVD	night vision device
OAKOC	observation and fields of fire, avenues of approach, key terrain, obstacles, cover and concealment
OSC	Open Source Center
OSINT	open source intelligence
PEO	peace enforcement operation
PEWD	platoon early warning device
PIR	priority intelligence requirement
POL	petroleum, oils, and lubricants
PLO	Palestine Liberation Organization
plt	platoon
PSYOP	psychological operations
PZ	pickup zone
RFI	request for information
RPG	rocket-propelled grenade
SALUTE	size, activity, location, unit, time, equipment (spot report)
SAM	surface-to-air missile
SAR	synthetic aperture radar

SBU	sensitive but unclassified
SIGINT	signals intelligence
SIPRNET	Secret Internet Protocol Router Network
SJA	staff judge advocate
SOCCE	Special Operations Command and Control Element
SOCRATES	Special Operations Command Research, Analysis, and Threat Evaluation System
SOF	special operations forces
SOP	standing operating procedure
SOR	special orders and requests
SPA	Special PSYOP Assessment
SPS	Special PSYOP Study
ST	special text
SWO	staff weather officer
TAI	target area of interest
TEC	Topographic Engineering Center
TECHINT	technical intelligence
TIM	toxic industrial material
TS	Top Secret
TTP	tactics, techniques, and procedures
UAS	unmanned aircraft system
UHF	ultra high frequency
US	United States
USAIC	US Army Intelligence Center
USAR	US Army Reserve
USSOCOM	US Special Operations Command
UTAMS	unattended transient acoustic measurement and signature intelligence sensor
UTFO	urban terrain feature overlay
UTM	universal transverse mercator
UTOG	urban terrain orientation graphic
UTP	Urban Tactical Planner
WGS	World Geodetic System
WIT	weapons intelligence team
WMD	weapons of mass destruction
WSS	Weapon Surveillance System
WTI	weapons technical intelligence

SECTION II – TERMS

avenue of approach

(joint) An air ground route of an attacking force of a given size leading to its objective or to key terrain in its path.term. (JP 1-02)

combat information

(joint) Unevaluated data gathered or provided to the tactical commander which, due to its highly perishable nature or the criticality of the situation, cannot be processed into tactical intelligence in time to satisfy the user's tactical intelligence requirements.(JP 1-02)

detainee

(Army) An individual who is captured by or placed in the custody of a duly constituted governmental organization for a period of time.(FM 34-52)

dislocated civilian

(Army) A generic term that describes a civilian who has been forced to move by war, revolution, or natural or man-made disaster from his or her home to some other location. Dislocated citizens include displaced persons, refugees, evacuees, stateless persons, and war victims. Legal and political considerations define the subcategories of a dislocated civilian. (FM 3-07)

displaced person

(joint) A civilian who is involuntarily outside the national boundaries of his or her country.[Note: Army adds: "or as an internally displaced person is a civilian involuntarily outside his area or region within his country." (JP 1-02)

enemy

The individual, group of individuals (organized or not organized), paramilitary or military force, national entity, or national alliance that is in opposition to the United States, its allies, or multinational partners.

enemy prisoner of war (Army) (EPW)

(Army) An individual or group of individuals detained by friendly forces in any OPERATIONAL ENVIRONMENT who meet the criteria as listed in Article 4 of the Geneva Convention Relative to the Handling of Prisoners of War. (FM 1-02)

infrastructure

(joint) All building and permanent installations necessary for support, redeployment, and military forces operations (e.g., barracks, headquarters, airfields, communications facilities, stores, port installations, and maintenance stations). (JP 4-01.8)

intelligence

(joint) 1. The product resulting from the collection, processing, integration, analysis, evaluation, and interpretation of available information concerning foreign countries or areas. 2. Information and knowledge about an adversary obtained through observation, investigation, analysis, or understanding. (JP 2-0)

intelligence preparation of the battlefield

The systematic, continuous process of analyzing the threat and environment in a specific geographic area. Intelligence preparation of the battlefield is designed to support the staff estimate and military decision-making process. Most intelligence requirements are generated as a result of the IPB process and its interrelation with the decision making process. (FM 34-130)

intelligence process

(joint) The process by which information is converted into intelligence and made available to users. The process consists of six interrelated intelligence operations: planning and direction, collection, processing and exploitation, analysis and production, dissemination and integration, and evaluation and feedback. (JP 2-01)

intelligence requirement

(joint) 1. Any subject, general or specific, upon which there is a need for collection of information or the production of intelligence. 2. A requirement for intelligence to fill a gap in the commander's knowledge or understanding of the operational environment or threat forces. (JP 2-0).

intelligence warfighting function

The related tasks and systems that facilitate understanding of the enemy, terrain, weather, and civil considerations. (FMI 5-0.1)

J-2X

The joint directorate responsible for controlling, coordinating, and deconflicting all human intelligence and counterintelligence collection activities and keeping the joint force J-2 informed on all human intelligence and counterintelligence activities conducted in the joint force area of responsibility. (FM 2-0)

key terrain

(joint) Any locality or area, the seizure or retention of which, affords a marked advantage to either combatant. (JP 1-02)

liaison

(joint) That contact or intercommunication maintained between elements of military forces or other agencies to ensure mutual understanding and unity of purpose and action. (JP 3-08)

lines of communication

(joint) A route, either land, water, and/or air, that connects an operating military force with a base of operations and along which supplies and military forces move. (JP 1-02)

line of sight

The unobstructed path from a Soldier, weapon, weapon site, electronic sending and receiving antennas, or piece of reconnaissance equipment to another point. (FM 34-130).

mobility corridor

(joint) Areas where a force will be canalized due to terrain restrictions. They allow military forces to capitalize on the principles of mass and speed and are therefore relatively free of obstacles. (JP 2-01.3).

named area of interest

(joint) The geographical area where information that will satisfy a specific information requirement can be collected. named areas of interest are usually selected to capture indications of adversary courses of action, but also may be related to conditions of the operational environment. (JP 2-01.3)

noncombatant

1. An individual, in an area of combat operations, who is not armed and is not participating in any activity in support of any of the factions or forces involved in combat. 2. An individual, such as chaplain or medical personnel, whose duties do not involve combat. (FM 3-07)

order of battle

(joint) The identification strength, command structure, and disposition of the personnel, units, and equipment of any military force. (JP 2-01.3)

priority intelligence requirement

(joint) An intelligence requirement stated as a priority for intelligence support, that the commander and staff need to understand the adversary or operational enviornment. (JP 5-0)

processing (intelligence)

(joint) A system of operations designed to convert raw data into useful information. (JP 1-02)

production (intelligence)

Conversion of information into intelligence through the integration, analysis, evaluation, and interpretation of all-source data and the preparation of intelligence products in support of known or anticipated user requirements. (FM 2-0)

relevant information

All information of importance to commanders and staffs in the exercise of command and control. (FM 3-0)

request for information

(joint) Any specific, time-sensitive ad hoc requirement for intelligence information or products to support an ongoing crisis or operation not necessarily related to standing requirements or scheduled intelligence production. A request for information can be initiated to respond to operational requirements and will be validated in accordance with the theater command's procedures. (JP 2-01)

Tactical Questioning

(Army) The questioning of the local population (noncombatants and enemy prisoners of war/detainees) for information of immediate tactical value.

terrain analysis

(joint) The collection, analysis, evaluation, and interpretation of geographic information on the natural and manmade features of the terrain, combined with other relevant factors, to predict the effect of the terrain on military operations. (JP 1-02)

Traffic Control Post

(Army) Manned post used to preclude interruption of traffic flow or movement along designated routes. They are used to support maneuver and mobility support operations only when needed. (FM 3-19.4)

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FM 2-91.4
20 March 2008

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